DOCUMENT RESUME

ED 178 436 SO 012 100

AUTHOR Hanson, Lola P.; Hanson, Kim
TITLE Urban Planning and Cognitive Mapping: An Elementary School Program in Urban Ecology.
INSTITUTION Virginia Univ., Charlottesville.
SPONS AGENCY Office of Education (DHEW), Washington, D.C. Office of Environmental Education.
PUB DATE 78
NOTE 150p.

EDRS PRICE MF01/PC06 Plus Postage.
DESCRIPTORS Business; City Planning; City Problems; Concept Teaching; Consumer Economics; Dramatic Play; Economic Factors; Educational Strategies; Elementary Education; Group Activities; Health; Human Geography; Learning Activities; Productivity; *Social Studies Units; Transportation; Unit Plan; *Urban Environment; *Urban Studies

ABSTRACT

This teacher's guide describes a program about urban ecology which can be used with children from kindergarten through grade six. The program comprises five units which explore concepts and practical issues of consumption in the home, health and well-being, commercial enterprise, transportation and networks, and production. Each unit's content is discovered and learned through four types of activity: class discussion led by the teacher, research (i.e., library work or surveys of family members), map-making, and dramatic play. The guide suggests how to schedule each unit's four types of activity according to the educational level and background characteristics of individual classes. Basic materials used throughout the program are wooden building blocks and six-inch high human figurines. These materials are used by the students as tools for cognitively mapping the classroom floor space into a miniature urban model during periods of dramatic play. The model becomes more complex and refined as students progress through the units and realize the need for things such as zoning restrictions, taxes, and subsidies. Interspersed throughout the guide are sample worksheets and newsletters. (AV)

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GOUNCIL GROVE III

URBAN PLANNING AND COGNITIVE MAPPING:

AN ELEMENTARY SCHOOL PROGRAM IN URBAN ECOLOGY

SP012 100

MANUAL FOR THE

URBAN PLANNING AND COGNITIVE MAPPING PROGRAM:

MACRO-ECONOMICS EDITION OF THE

COUNCIL GROVE EKISTICS CURRICULUM

BY

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Program partially funded by a grant from
The Office of Environmental Education,
Washington D.C., a Federal Agency of
The Office of Education, HEW

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ACKNOWLEDGEMENTS

We would like to thank the following people and organizations for their cooperation in supporting and implementing this program:

U.S. Office of Environmental Education

The Honorable Charles Wilson, Congressman, 31st District

Mr. Ralph Rinzler, Director, Festival of American Folklife, Department of Performing Art, Smithsonian Institution

Mrs. Kate Rinzler

The Compton Health Center

Los Angeles County Office of Environmental Sanitation

Compton Fire Department Headquarters, Station # 1

Mr. Burt Barrett, Public Relations, Pacific Telephone

The Compton Bulletin

The Herald American Newspaper

The Metropolitan Gazette

Xerox Corporation

We give particular thanks to the children and parents of the Pathfinders Class, Council Grove III Community School, Compton, California; and to Dr. Larry Gower, Donald Hanson, Martha Salazar, and Dr. Stuart Elliott.

PURPOSE OF THE COUNCIL GROVE
URBAN PLANNING AND COGNITIVE MAPPING STUDY

"Environmental Education is the educational process dealing with man's relation with his natural and man-made surroundings, and includes the relation of population, pollution, resource allocation and depletion, conservation, transportation, technology, and urban and rural planning to the total human environment."

Environmental Education Act, 1970
(Public Law 91-516)

The Purpose of this Urban Planning Study is to implement the provisos in the Environmental Education Act. The study's methodology and social aesthetic framework equip the children in the inner cities with the necessary linguistic tools, experiences and knowledge for participating with dignity in a world of radical change.

FOREWARD

The Urban Planning and Cognitive Mapping Study presented in this manual was developed at an inner city elementary school called Council Grove III. At Council Grove, the Urban Planning Unit is part of a comprehensive elementary school Ekistics Curriculum. "Ekistics" is defined as the comparative study of human settlements, historical, contemporary and Utopian.

The Council Grove Ekistics Curriculum organizes the research orientations of Anthropology, History and Geography into a series of cultural ecology units. The units range from macro and micro-economic studies to investigations of Arid Climate Cultures to the historical foundations of basic social institutions, nationally and internationally.

All of these units are fitted to the social-maturational development of children from kindergarten through the sixth grade. As such, the Urban Planning Study is most effective under conditions in which the major concepts and research methodologies can be re-iterated in new forms and settings as a progressive process of guided development over a period of years. However, this unit may be effectively implemented independent of the other curriculum units. The Urban Planning Study has been designed as a self-contained unit to be implemented in a self-contained classroom setting. It can be substituted for other social studies programs on an individual classroom basis.

The amount of time alloted to basic skills work in the proposed weekly schedule in Figure 5 may appear small to some teachers. However, the Urban Planning Study not only serves as a powerful motivating force for mastering these skills, thereby increasing the effectiveness of each hour spent on basic skills per se; the program also calls on every child to digest large amounts of printed information and produce great quantities of written work. The Urban Planning Study is not intended to replace drill and practice work in the basic skills, but to support it and enhance its effects.

The design of the study allows the teacher to adjust the program to the particular level of his class, and to allow a great deal of latitude for individual differences within the class. The study calls for a large amount of library research on job functions, and the readings for this area can be selected for whatever level of difficulty and detail the teacher feels is appropriate.

Lastly, it is strongly recommended that the users of this manual utilize the diverse cultural resources incorporated in their classroom eco-system: the biographical content of their individual pupils and the social and aesthetic "world views" of the parents.

Toward this multicultural involvement, the manual acknowledges the contributions of the dedicated parents and community people that contributed so much to this study.

TABLE OF CONTENTS

Introduction: How to Use The Manual	1
Urban Planning Ecology Simulation and Floor Tool Map	12
The Dramatic Play Mode	12
Social-Cognitive Considerations	13
Descriptions of Dramatic Play Materials	14
Organization of the Macro Economics Simulation	17
The Urban Ecology Tool Map	20
Topical Areas	21
Rules of Consumption	27
Production Rules	29
Rules of Exchange	30
Scenarios	31
Government	31
Taxes	32
Subsidies	36
Judicial System	36
Unit I Consumption: The Home	41
S-1 Universal Human Needs	42
S-2 Ideal Home	43
R-1 Ideal Home	45
C-1 Listing Needs	48
C-2 Family Graphs	50
D-1 Early Man	52

Unit II Health and Well-Being 53

S-1 Health and Well-Being 54

S-2 Social Aspects of Well-Being 56

R-1 Fire Safety 59

R-2 Environmental Health 61

C-1 Mapping a Wholesome Environment 64

C-2 Map Symbols 65

C-3 Map Symbols B 66

Unit II Commercial Enterprises 68

S-1 Where Do We Get The Things We Need? 69

S-2 Money and Barter 70

R-1 Trade 72

C-1 Fantasy Map Trip 74

C-2 Sandbox Map 77

C-3 Sand to Paper 78

C-4 Sand to Paper to Sand 79

Unit IV Transportation and Networks 80

S-1 How Do Things Get From Where They Are Made To Where They Are Used? 81

S-2 Networks 82

R-1 Transportation 83

C-1 Routes to School 86

C-2 Combining Routes to School 87

C-3 Networks 88

Unit V Production 91

S-1 Production 92

S-2 Division of Labor in the Classroom 93

S-3 What is the Basis of Division of Labor? 94

S-4 Interdependency 96
R-1 Division of Labor in the Home 99
R-2 Manufacturing and Agriculture 102
C-1 Product Mapping 105
C-2 Color Contour Maps 107
C-3 Line Contour Maps 111
Table Model 113
Bibliography 131

INTRODUCTION

HOW TO USE THE MANUAL

The Council Grove III Urban Planning Curriculum is organized in four inter-dependent tracks: Seminars, Research, Cartography and Dramatic Play. In the text these are listed respectively as "S", "R", "C" and "D". Each track is made up of a series of activities, each of which is described in the text. The activities should not be thought of as individual class periods. Many of them will require two or more class periods to be completed, and some are designed to be repeated later in the year, at the instructor's direction. Chart I is an outline of the tracks and the activities within them.

Chart I indicates the recommended flow of events for the curriculum. An instructor should not be overly concerned if some activities require more time than is indicated here, as others will undoubtedly require less. Many of the activities in different tracks are closely related and deal with the same immediate subject matter. Others have no direct connection with the subject matter of other tracks, but are designed to prepare the class for future activities.

Activities from each track are grouped into subject groupings. These do not necessarily indicate an identity of subject matter in all the activities of the group. Rather, the subject groupings

FIGURE 1

CHART I

		I	II	III	IV
UNIT I CONSUMPTION: THE HOME (4 weeks)	Seminar:	Universal Human Needs	Ideal Home		
	Research:	Ideal Home Questionnaire			
	Cartography:	Listing Needs	Family Graphs		
	Dramatic Play:	Early Man			
UNIT II HEALTH AND WELL-BEING (5 weeks)	Seminar:	Health and Well-Being	Social Aspects of Well-Being		
	Research:	Fire Safety	Environmental Health		
	Cartography:	Mapping a Wholesome Environment	Map Symbols	Map Symbols B	
UNIT III COMMERCIAL ENTERPRISES (6 weeks)	Seminar:	Where Do We Get The Things We Need?	Money and Barter		
	Research:	Trade			
	Cartography:	Fantasy Map Trip	Sandbox Map	Sand to Paper	Sand to Paper to Sand
UNIT IV TRANSPORTATION AND NETWORKS (4 weeks)	Seminar:	How Do Things Get From Where They Are Made To Where They Are Used?	Networks		
	Research:	Transportation			
	Cartography:	Routes to School	Combining Routes to School	Networks	
UNIT V PRODUCTION (6 weeks)	Seminar:	Production	Division of Labor in the Classroom	What is the Basis of Division of Labor?	Interdependency
	Research:	Division of Labor in the Home	Manufacturing and Agriculture		
	Cartography:	Product Mapping	Color Contour Maps	Line Contour Maps	

indicate the dominant theme of the curriculum for the time period involved. Some tracks, particularly the Cartography track, will show a marked independence from the rest at many points.

For these reasons it is important for the teacher to be familiar with the entire curriculum before embarking on any phase of it, so that he will be able to gauge how much latitude to allow in completing activities.

Except where otherwise indicated, the Research track should have the following organization: A period should be scheduled regularly three or four times a week as Research Period. This time should generally be used to do library research on the subject matter of the current Seminar. In particular, children should read about particular job functions that are appropriate to the subject grouping, or about which questions have arisen in the Dramatic Play sessions. They should write reports and deliver them orally to the class, so that the entire group may benefit from their efforts. (See Illustrations 2 and 3.)

Dramatic Play periods should be scheduled twice a week, or more often if other areas of the program will not suffer. These periods should comprise the entire morning period, between the time the children arrive at school and the time they break for lunch, with a brief recess in the middle. On some occasions the teacher may find it desirable to extend a period into the afternoon to follow up on discoveries made in the morning.

Each class period, whether or not it comprises a full activity, should have the following components:

LEVERS & PULLEYS.

BY CHRISTINE CRAIG
AGE: 8

If you weigh 50 pounds you can lift a 200 pound ~~weight~~ weight. If you had four loops of rope in the pulley, or you can lift a 200 weight with a fulcrum.

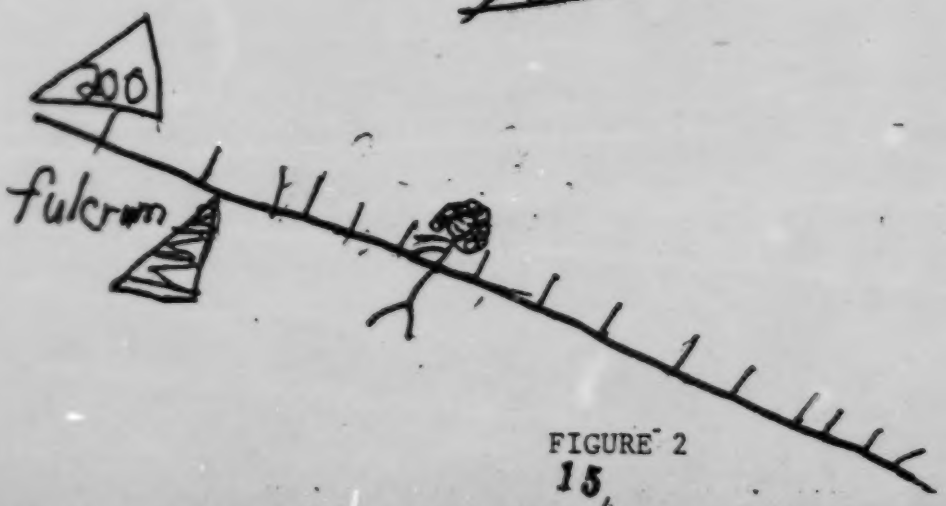


FIGURE 2

BY NOVA BURCH
AGE: 7

Citrus Fruits are Oranges Lemons and Grapefruit. Fruit that is to be used for Juice need not be handled as carefully as that Shipped in large Quantities.

Waxing, cleaning, drying and waxing is one process without a Stop.

Waxing prevents the Skin from drying and Shrinking.

It makes the Fruit keep better.

He takes Samples off the conveyor as they come along. He Cuts them open to See if they are graded properly.

FIGURE 3a

Each orange runs into a slot which carries it under a wheel with a ridged rubber tire. The wheel presses the fruit down on a heated steel stamp bearing the brand name. When fruit is stamped it tells the Buyer he has fruit of a good quality.

FIGURE 3b

(1) Teacher Preparation - It is essential that the instructor have on hand any relevant materials and understand how the current unit fits in the overall curriculum.

(2) Planning Period - The teacher presents to the students the nature of the activity or the problems to be dealt with, and plans with them how the class or individuals within the class will approach the problems. This should also include a review of previous class activities which are relevant to the present one, and a discussion, if necessary, of the place of the current activity in the curriculum and its goals and purposes.

(3) Action Research - This phase constitutes the body of the activity itself, whether it is hands-on work with a mapping project or library research on a tuna cannery.

(4) Review and Evaluation - The class should come together and evaluate, with the teacher's assistance, the period's work. This evaluation should cover new discoveries, problems that have arisen, measures of whether goals set out in the planning period have been or are being met, questions of individual styles of work, and pre-planning for future related projects. The last mentioned item should be used by the instructor as a feed-back device to measure the class's acceptance and understanding of the material: Motivation and a good grasp of the principal elements are both required to make useful suggestions for future projects. For a detailed example of this format, see Chart II, Dramatic Play, General Plan.

The manual itself is arranged in the following way: The Dramatic Play track is discussed first. This track does not lend

CHART II

DRAMATIC PLAY
GENERAL PLAN

Group Planning Phase:

1. Individual pupils choose job function:

2. Introduce basic research objectives:
   a) Their significance to previous simulations and results.
   b) Organization and allocation of play accessories for new job function.

3. Time budgeting of Dramatic Play Phase:
   a) Construction of floor model
   b) Simulation
   c) Evaluation
   d) Clean-up of materials

Dramatic Play Phase:

Run through stipulated time budget for:

a) Construction of job sites, structures, accessories; distribute money, receipts and accounting forms.

b) Dramatic Play

Evaluation:

a) Teacher reports observations

b) Individual child reports

c) Establish priorities ranked in terms of short-term and long-range goals.

FIGURE 4

itself, for reasons discussed in that section, to a strict ordering of events. The elements indicated for the Dramatic Play track in Chart I are thus suggested and likely places for certain subjects to be dealt with. It is certain that individual groups will vary from the scheme presented in Chart I, but they should not be thought of as making discoveries 'out of turn'.

After the Dramatic Play track, the remaining tracks are dealt with as grouped around subjects. These subjects are Human Needs; Health and Well-Being; Commerce; Transportation and Production. The focus of each Subject is the job function within the community as it represents the concepts indicated in the Subject heading. The manual is organized so that the Seminars, Research Projects and Cartography Projects of each Subject Group are listed together, in that order. However, they are intended to be presented in the order of the pages: these are parallel tracks, each of which should proceed alongside the others. Chart III presents a possible weekly schedule for administering the curriculum.

Finally, the Table Model Project is addended to the text. This project should be begun in November or December as a semi-independent aspect of the Cartography Track. Because of the long-term nature of this project it was thought wise to include it as a series of broken up activities. Scheduling work on the project is left to the teacher's discretion, with the suggestion that he should plan for it to be finished, physically in early April so that it may be used as a tool in planning a community on a larger scale than the floor model.

CHART III

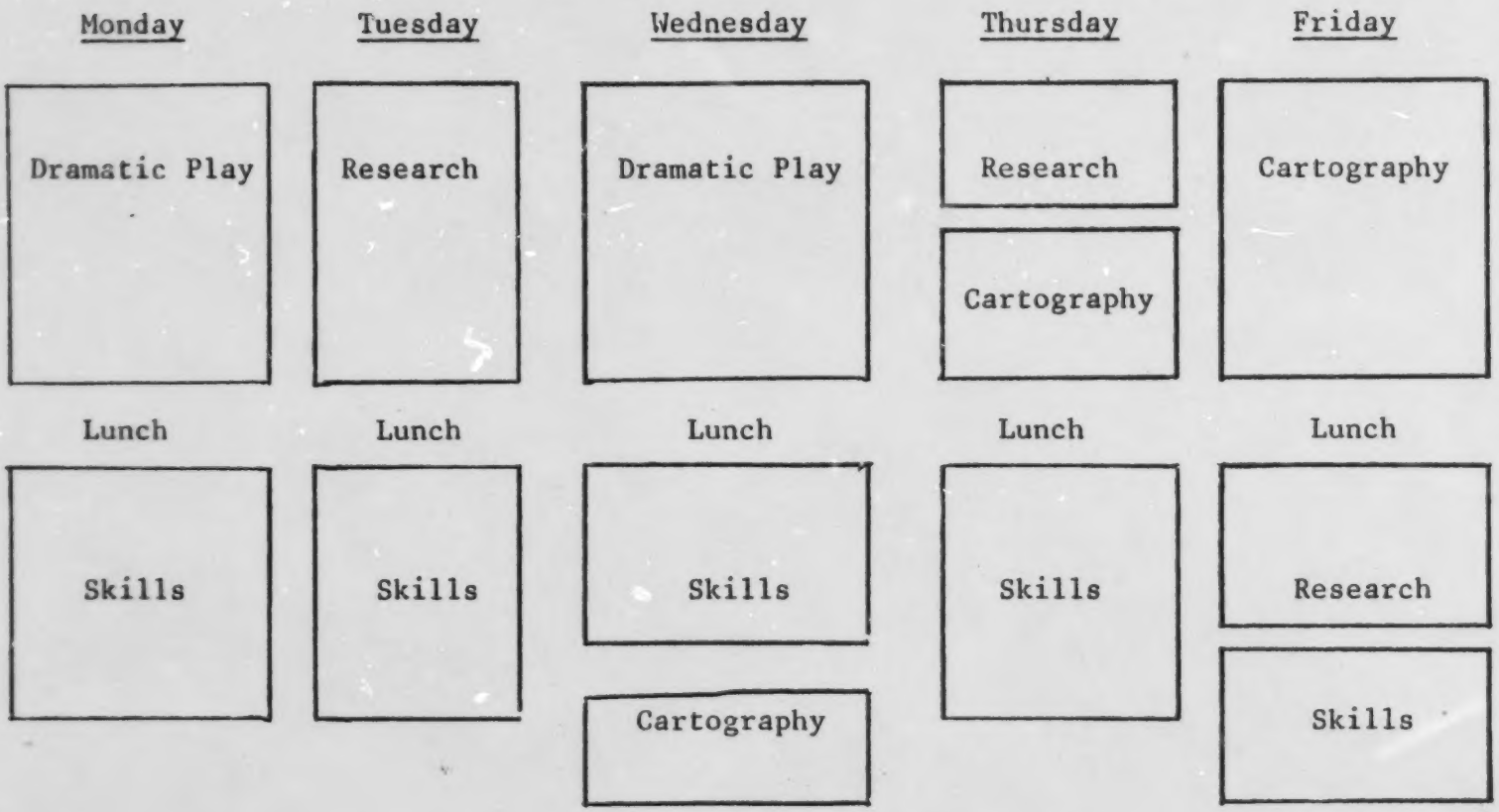


FIGURE 5

A note on the Research Track: Since most Research Periods will be used for library research on job functions, these have not been mentioned. Specific research projects have been included only where they vary from this pattern. Teachers may wish to include other such projects. Furthermore, field trips, either for the whole class or selected committees, should be organized as often as possible to job functions being studied or about which the children have questions. These should be discussed and reported on as any other class acitivity.

Such field trips are made especially important by the fact that few books written about occupations or work processes for children on the elementary level can adequately answer many of the questions that are likely to arise from the Dramatic Play activities.

The last four weeks of the school year should be devoted entirely to problems of government. By this time the material basis of the community should be well established and well understood by everyone in the class. Thus the seminars can be given over to extended discussions and evaluations of issues of government that come up in the Dramatic Play track. Some Research periods may be used to study various forms of government, but the instructor may wish to reschedule most of this time for Dramatic Play or Seminars. The Cartography track, in combination with the Seminars, may then be used to, using the Table Model, design various physical arrangements of communities and discuss the social effects that might result from them.

URBAN PLANNING ECOLOGY SIMULATION

AND FLOOR TOOL MAP

The Council Grove Urban Planning Study is oriented around an urban ecology tool map, constructed by the class through a social and job-centered sequence of Dramatic Play. The individual topical areas and basic job functions in each episode of Dramatic Play are introduced and take shape within the context of satisfying the full range of individual and social needs. The topical areas described in this manual do not displace any of the other facets of community interaction. A specific topical area, e.g. division of labor, is introduced simply to raise the level of sophistication in a given Dramatic Play episode.

The Dramatic Play Mode

In regard to the education of elementary school children, it is important that a distinction be made about the terms "game", "simulation" and "dramatic play".

In a "game", the players are governed by a specified and limited set of conditions or rules, and in many cases, a game leader. The orientation of a "game" activity is primarily finding the most efficient means for achieving a pre-conceived end.

Contrastingly, a "simulation" is primarily an inductive activity. The goals in the main, are left to the definition

of the participants. In general, a "simulation" promotes creativity, innovation and self-direction.

In any simulation, the broad range of problems to be solved is defined by the way in which the "simulation" rules are abstracted from reality. In "dramatic play", these abstractions are based on the level of maturation of the players. Hence the principal distinction in "dramatic play" is that the entire activity is grounded on the facts of a given phase of maturational development. Obviously, there is a profound difference between the way seven-year olds and seventeen-year olds think.

Social-Cognitive Considerations

The particular design of the Dramatic Play featured in this manual is based on Jean Piaget's description of the maturational, social and ideational characteristics of primary grade children.

Piaget titles this particular stage of development, "the phase of concrete operations". His findings establish that free social play with a variety of manipulative materials are the primary media for anchoring the child's experiences in a rational and communicable system. Through multisensory exploration of his social and physical environment, the child becomes less and less tied to an ego-centric, affective based perception of reality.

Piaget established that the primary grade child's understanding of space is at first confined to topological relationships (proximity, separation, order, surrounding, continuity of lines and surfaces, etc.). Until the child can make the correspondence between the proper symbolic or linguistic terms for his spatial perceptions, he cannot order (measure) objects and events into a coordinated system of references.

In the following quotation, Piaget openly acknowledges his own failure in his early studies to recognize the pedagogical significance of manipulative materials and social play.

> "I well knew that thought proceeds from action, but I believed (at first) that language directly reflects acts and that to understand the logic of the child one had only to look for it in the domain of conversations or verbal interactions. It was only later, by studying the patterns of intelligent behavior...that I learned that for a complete understanding of the genesis of intellectual operations, manipulation and experience with objects had first to be considered."[1]

These considerations form the foundation of the Council Grove curriculum.

Descriptions of Dramatic Play Materials

The basic materials featured in the Council Grove program are wooden building blocks and six inch high miniature "personna". These manipulative materials are used by the class as a set of linguistic tools for cognitively mapping the classroom floor space into a miniature urban model.

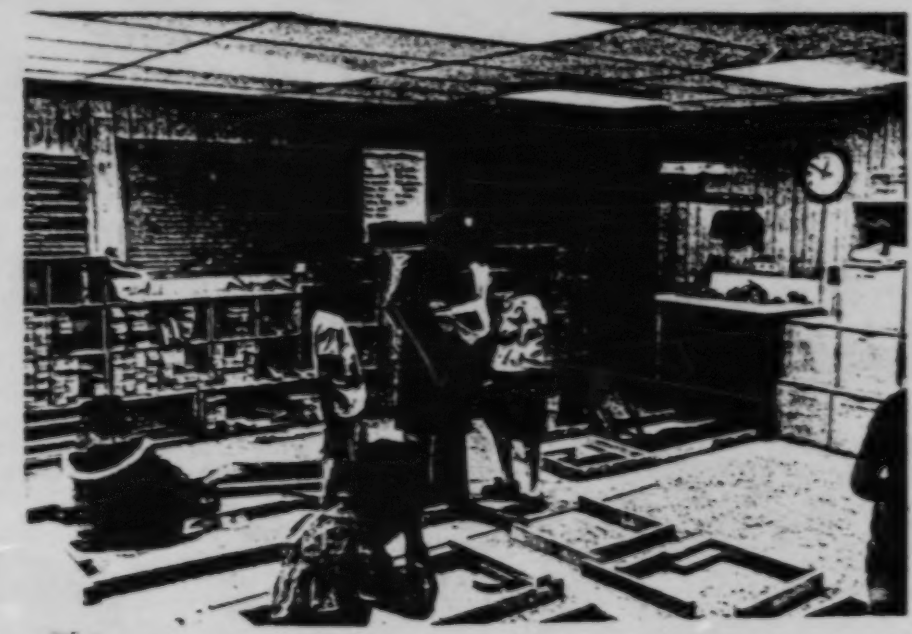
Each child uses the blocks and the personna to describe on the floor his aesthetic perceptions of the physical and social environment. The blocks are used to map the floor space into zones for carrying out the variety of occupations that comprise a macro-economics urban system.

For the purpose of this description, macro-economics is defined as the interaction of basic institutions that comprise the economy of a community.

---

[1]Piaget, J., Autobiography of Jean Piaget, in H. Longfeld et al. (Eds). A history of Psychology, Vol. IV, Worchester, Massachusetts, Clark University Press, 1952, pp. 237-256.

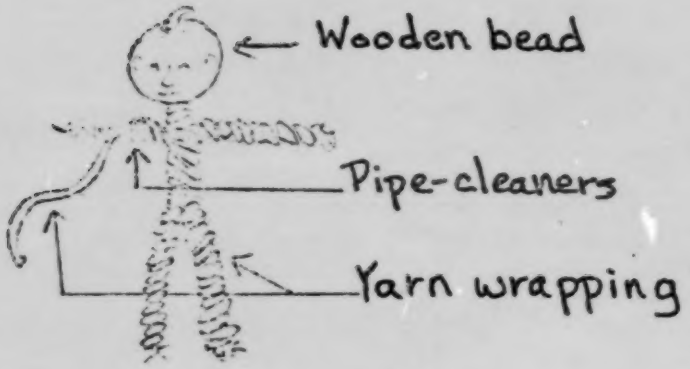
In each zone, the blocks are used to construct a variety of dwellings and job sites. These block constructions and the accesories made by the children to operate their particular jobs, are all scaled to the dimensions of the miniature personna.



(1) Building Blocks - These architectural materials are basic equipment in many primary grade classrooms. The various block components that comprise a basic classroom set are coordinated geometrically around a rectangular 1½" X 3" X 5½" unit. It is recommended that the blocks be stored in such a way as to educationally capitalize on the measurement and architectural features of these materials. The particular places assigned for storing each set of components should be labeled with their proper measurement terms. The children should be able to see the blocks as interrelated parts of a classified system of linear and geometrical terms.

(2) The Miniature Personna - The children during one work session can make a classroom set of flexible dolls out of inexpensive materials: Pairs of heavy weight, craft-type pipe cleaners are twisted together to form a headless human skeleton. Heavy-weight yarn is then wrapped tightly around the entire skeleton to strengthen it without losing the flexible features of the pipe cleaner figures. A wooden bead is attached for the head of the personna.

The abstract qualities of the personna remove much of the stigma older children and particularly boys may attach to "playing with dolls". Unlike the commercially made role play dolls, which by the way, are very expensive, the pipe cleaner personna do not lend themselves to racial, socio-economic or sexual stereotyping.



Pipe Cleaner Personna

Organization of the Macro Economics Simulation

Each block building session in macro economics is socially structured into three distinct research orientations or phases. These orientations are:

1) A group planning phase for establishing the objectives, priorities and time budget for Phase 2.

2) Action research through a job-centered mode of dramatic play.

3) Group evaluation of the dramatic play using three primary references for the discussion.

   a) Teacher's observations of the problems, solutions and issues raised in the dramatic play;

   b) The floor model constructed by the class during the dramatic play;

   c) The individual child's report about problems, solutions and issues encountered during the dramatic play.

After the class evaluation, the teacher records the items arrived through consensus. These written summations can later be transcribed into newspaper reports for informing the families about the progress of the study (see Figures 6 and 7), time lines and individual pupil work prescriptions.

The evaluation of the block building session is also worked into the problem focus for the next planning phase of the dramatic play.

Through this ritualized sequence of planning, action research and evaluation, the class makes a cognitive passage from: the here and now (planning phase); to the futuristic domain as comprehensive planners and policy makers of a model utopia (action research); and back to the contemporary world as a classroom constituency.

Council Grove News
Pathfinders' Edition

Yesterday Dr. Hanson came in the Pathfinders' Classroom and we did block building and we made food for our community. Today we finished making new accessories for our block building community. Besides making food, some people made fish nets, and others made telephones and some people made clothes. A few other people did research on farming and fishing.

On Friday there is no school because it is the teachers' planning day.

By LaRhonda Perry.
AGE: 8

FIGURE 6

Reporters: Shawn Truby AGE: 7
Stacy Reed AGE: 8

Council Grove News
Pathfinders' Edition

Today we had Urban planning. John T. was not willing to work on his produce farm; it was auctioned off and sold to the highest bidder for 19¢. A problem came up when LaRhonda was missing some money. However, we don't have any rules.

(We Voted that one role is there will be no stealing Here are the proposed penalties. fine 7¢, fine 5¢, give back all money stolen, or sit out the rest of the period. We voted for sitting out for the rest of the period.

Mr. Hanson says the community must have a mayor who will receive proposals for the laws. Then the mayor will write the law, promulgate it and have a vote, Stacy was voted mayor.

FIGURE 7

From their various vantage points as planners, environmentalists and as scholars, the children discover that they can make a positive or negative effect on their social and physical environment.

This feedback function of the class-constructed urban ecology model develops for the child the concepts of self, objects and events into meaningful measurement terms; i.e. values.

The child experiences "balance", "unbalance", "symmetry", "order", "interdependency", "well being", etc. The teacher facilitates cognitive growth by helping the child make the correspondence between the proper linguistic form, term or mode and his aesthetic perceptions objectified in the dramatic play.

The Urban Ecology Tool Map

The tool map is the focal point of the entire urban study. It is the laboratory in which the concepts the children gather in their non-school experience and their formal studies are tested and refined.

The role of the teacher is to set the conditions for the work period, to observe the dramatic play for the purpose of contributing to the class evaluation and to facilitate certain processes such as accounting and judicial proceedings.

For the teacher, the tool map is a feedback device which informs on the child's grasp of concepts and readiness for new concept building.

The topical areas and basic job functions described in the manual must be adjusted to fit the dynamics of each class of children.

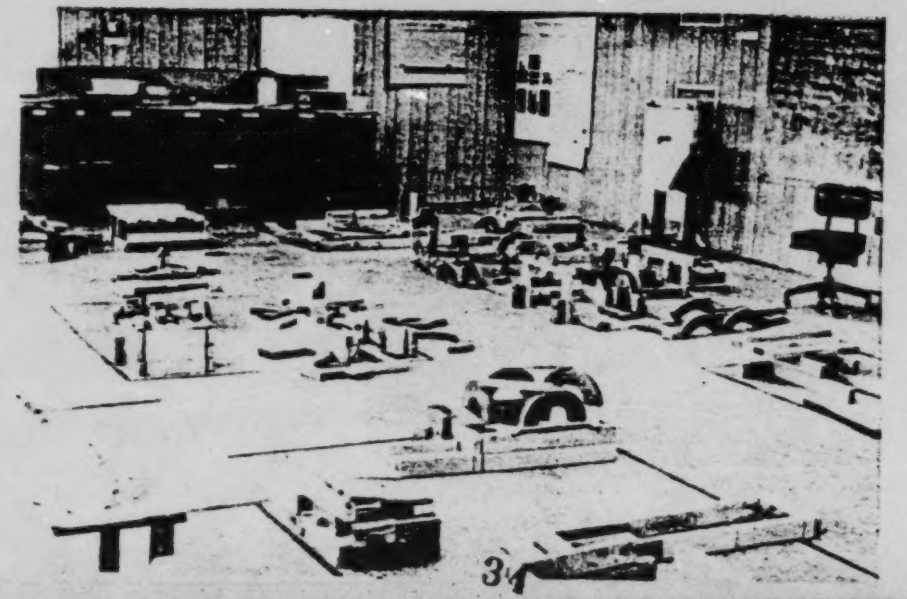
Each topic should be discussed as it becomes an issue in the children's dramatic play; however, each topic should be introduced by the teacher by a given date (see Figure 1, page 2) if the children have not raised the issue themselves. The tool map therefore provides a concrete feedback foundation for adjusting the timing, emphasis and duration of each component discribed below:

Initiation Phase - The children choose a job from a classroom job chart. They then choose a site on the floor and proceed to build a structure for carrying out their particular job function. Each child should be given or should make the accessories associated with his function (see Figure 8).

In the initial phases, there should be no money, no restrictions on land use, no rules governing production or consumption.

Topical Areas

Land Usage I - Children will probably discover that the haphazard construction of buildings makes travel difficult. They should derive a scheme for laying out streets. Each function must be built in an area between streets. Streets can be made by laying down masking tape.



If I worked at the telephone company, I would climb telephone poles and fix peoples telephone.

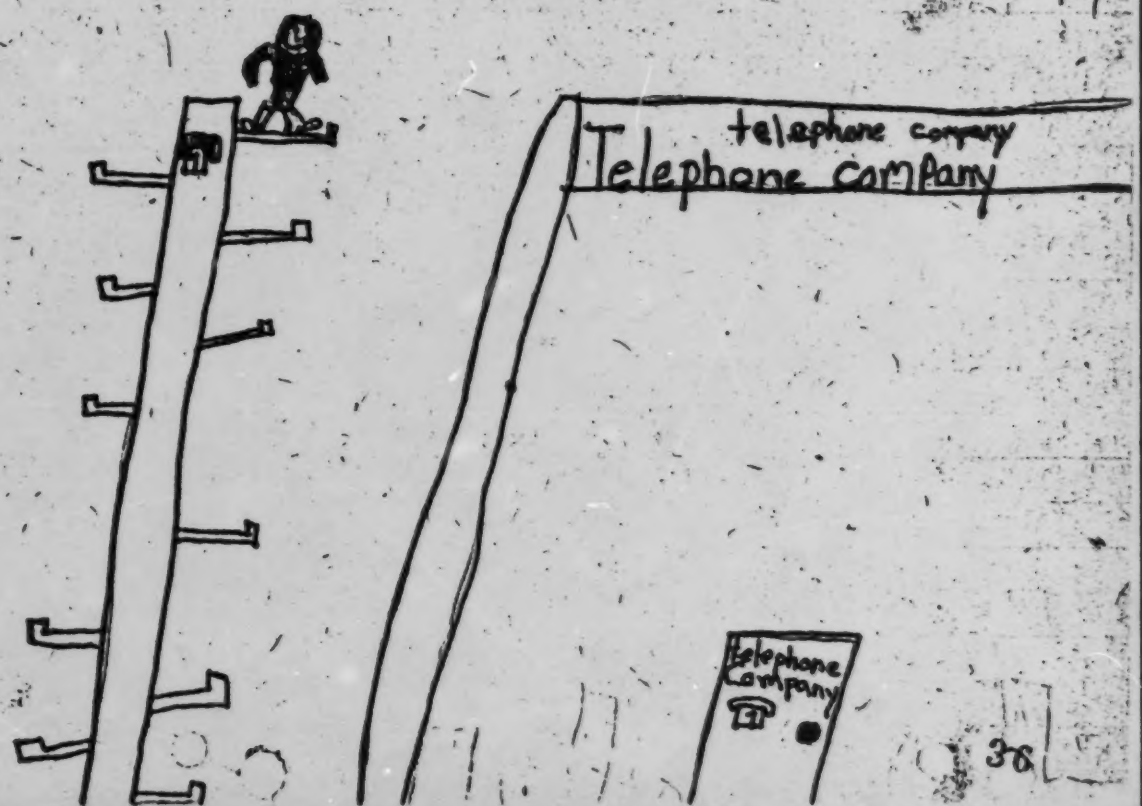


FIGURE 8

Land Usage II - Zoning - The issue of zoning may arise for a variety of reasons. One is the association of certain functions with natural resources. Another is the association of certain resources with each other; e.g. grouping stores with homes. The third is the positive or negative side effects of certain functions such as the odor of the tuna cannery, the noise of the freight train, etc.

The children should experiment with a variety of zoning schemes which should be evaluated according to the following criteria:

Are transportation problems minimized?

Are aesthetic qualities maintained at a reasonable level of health and well being?

(See Figure 9.)

Land Usage III - Ownership & Distribution - Until now the children have simply been able to select a site according to their own criteria and possible rudimentary zoning limitations (see Figure 10). This reflects one historical mode of acquiring land.

As the simulation rules on production, consumption and trade become more sophisticated, various schemes of land distribution will become practical.

The Land Auction - The teacher prepares deeds for each lot and provides each child with a sum of money. The amount of money given to each child may be varied to reflect either "egalitarian" ideas or "realistic" distributions.

Each child may then bid singly or in partnership on any lot or lots as the teacher offers them for sale. Whatever money he

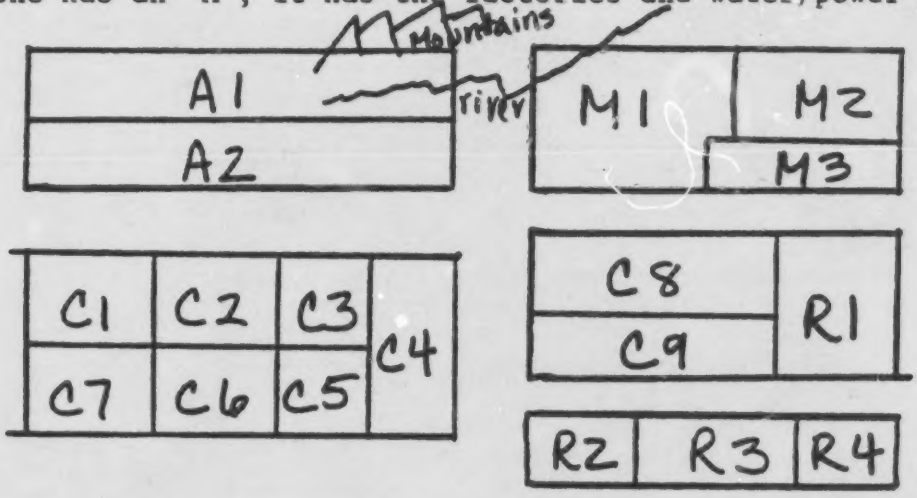
Council Grove News

Pathfinders' Edition

Yesterday, John H., Paul and Jemal drew up a contract because they worked together on the market and produce farm. This is their contract:

> "John H. is the boss. If he fires us before 10 days, we can get 33¢, but if we quit before 10 days, we only get 14¢. John H. owns all of the property."

Today we divided up the room into different zones - commercial, agricultural, residential and manufacturing. Commercial is labeled "C" and means where the stores are. Agricultural areas are marked "A" and are where the farms are. Residential areas are "R" on the map and are where the houses and school are. The Manufacturing zone has an "M"; it has the factories and water/power department.



The Pathfinders bought deeds to the pieces of land. They held an auction and the highest bidder got the property. Christine got A1 for 23¢ and Stacy bought A2 for 14¢. Cheryl paid 7¢ for the land marked R4 on the map.

We decided the deed must be signed by the owner and if he sells his land, he must sign the deed again and have the new owner sign it.

FIGURE 9a

Council Grove News Cont.

Pathfinders' Edition

We took a vote about the school in our small community; on other days we have had to pay to go to the school - today we voted to see if the community should pay for the school with public funds (tax money). The vote was against using tax money.

Taxes were collected on property again today. The tax is 1¢ for every 4 squares on the floor. PARENTS - what are your rates for taxes? Are they too high?

Reporter: Shirlyce Manning

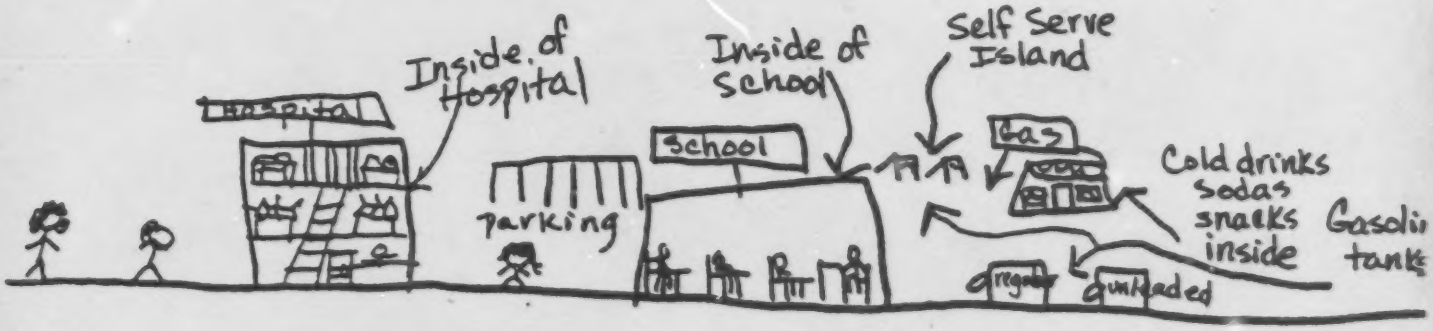


FIGURE 9b

Council Grove News
Pathfinders' Edition

By LaRhonda and Stacy

Today in mapping we looked at the classroom to see where we should put the mountains and the ocean on our floor. We made sections on the map; one was the commercial Zone, one was the agricultural Zone and the last was the manufacturing Zone, Later, we had a test on Zoning.

This morning we had an assembly, We talked about the play time equipment miss Levine took all the groups on a tour all over school showing us the places to play. equipment like new balls, jacks, drama costumes and miniature army men and dinosaurs.

In urban planning today we defined economics." It is the allocation of scarce resources." we want to ask our parents who should make the laws.

FIGURE 10

does not spend constitutes his working capital to begin the simulation. The fund collected by the teacher will furnish the city's treasury. Children will have to purchase lots appropriate to the function they wish to operate as defined either by zoning or in relation to natural resources. For natural resources, strips and circles cut from cloth or felt are used to symbolize bodies of water (fresh or ocean) and agricultural areas.

Rules of Consumption

Children operating jobs with disadvantageous economic relations will probably find that the easiest solution of their problem is not to buy things. If the simulation is to remain informative, rules establishing a "reasonable", if not realistic, pattern of consumption must be made.

The first and most important aspect is diet. A minimum diet for adults and children must be established by the teacher. Failure to consume this basic diet results in the death of the personna (see Figure 11).

The diet should be simple but balanced to the productive functions of the community. If milk is considered an essential food, while vegetables are not, the produce farmer will be forced out of business by lack of demand. This diet should be adjusted to reflect new functions in the community. The teacher should make a chart showing each child and his or her dependents, if any. During each session, the child shall bring to the teacher the required items for survival which the teacher will keep and mark on the chart: this represents consumption. The various "food" items can be made by the children out of plasticene. These items and all other job accessories are scaled to the dimensions of the personna.

Council Grove News
Pathfinders' Edition

This morning we did block building. Everyone had to buy two different vegtables, one piece of bread, one piece of meat, and one container of milk; then we have to give it to mr. Hanson, but if we did not give that food to mr. Hanson our little person would be dead. In Other words we were making sure that every one had a balanced diet. This morning in urban planning we used a chart about how we should have a balanced diet. Here is a chart of it.

Name	Job	Size of Family	Starting funds	Ending funds	Income	Foods eaten
Deedee						
Jemal						

We also used the chart to see if people made any income By Dedee and Jemal.

FIGURE 11

Once the children are accustomed to dealing with this basic diet, similar rules for clothing, water, electricity, etc. may be established. A precaution to the teacher - the children tend to get carried away with composing such rules. Too great a number of rules will make it impossible to conduct the business of the community.

Production Rules

The first effect of the institution of consumption rules will be that producers of essential products will command the economy of the community. This results from the fact that they have an "unlimited" quantity of products to dispose of without cost to themselves. A real farmer's production of food is restricted by the amount of land he has, availability of machinery and the amount of labor he is able to exert in production. To reflect these "realities", a system of abstract work should be introduced. In this abstract system, a producer is required to do a set amount of "sit-ups" in order to produce a given quantity of his product.

PRIMARY PRODUCTION TABLE

Produce Farm:	Vegetable	- 2 sit-ups
	Bag of Flour	- 2 sit-ups
Cattle Ranch:	Cut of Meat	- 4 sit-ups
Dairy Farm:	Container of Milk	- 1 sit-up

The production of some goods, such as electricity, cannot be governed by these rules. It should be practical to leave such rulings out of the work system and encourage, through the evaluation sessions, reasonable conduct on the part of the operators. Other-

wise, highly abstract restrictions may be imposed by the teacher.

Other goods may require "recipes" if they are made from goods produced in other parts of the system.

SECONDARY PRODUCTION TABLE			
Clothing Factory:	Bolt of Cloth	=	2¢
	Dress	=	Bolt + 4 Sit-ups
Bakery:	2 Loaves Bread	=	1 Bag Flour + 1 Container Milk + 3 Sit-ups

Another caution - the desire to make explicit each step in a productive process must be restrained. In an overzealous attempt at realism, the Council Grove children introduced a flour mill as a separate function to grind wheat before it could be made into bread. This added labor increment drove up the price of bread out of all proportion to other commodities. Also, this created such a bottleneck in the production of bread that not enough could be produced for the entire community. This was nevertheless a useful educational experience.

As the class learns how to use these production rules, some may be added which for example give the amount of produce which can be "grown" on a given amount of floor space.

Rules of Exchange

In the beginning, children should be able to exchange goods and services as they please. As they begin to find this cumbersome, money may be introduced. The teacher should occasionally throughout the year's study revert to barter to increase the children's understanding of various modes of economic exchange.

Scenarios

Initially, each class work period or dramatic play session will be a separate entity. Each day's work will begin fresh; the only traces of earlier scenarios being in the participants' heads. Later, however, it will become important to follow situations through for several class periods. Only in this way can certain economic relations manifest themselves in the format of the urban ecology tool map. To facilitate this, the teacher should keep a record of property deeds, consumption rules, of funds left over and inventories, if any. The teacher's log enables the class to begin the next day's simulation where the last simulation left off. Each class period, however, should remain a single and complete unit of the economic cycle.

As with the distribution of land, the teacher should distribute money to begin scenarios according to various formulas:

1) An equal amount of money for everyone.

2) A random distribution of widely varying amounts of money.

3) Giving more money to operators of a particular set of functions:

   a) More money to powerful economic units, such as the Electric Company. (This is a "realistic" distribution.)

   b) More money to disadvantaged functions, such as homemakers. (This is a "fair" distribution.)

Government

As the dramatic play becomes more sophisticated, government will have an important function - it should soon be obvious that health, fire and police functions cannot be run as private

enterprises. Government must come into being to support these functions. Below are two possible Government Modes:

(1) Universal election of civil servants such as a fire department, police department, etc. This will be found to be a cumbersome scheme because of the problems of calculating salary, tax rates, land use and acquisition, laws and responsibilities (see Figures 12 and 13).

(2) The Mayor - A mayor is chosen by one of a variety of schemes. The mayor's job is to hire and fire municipal employees, collect taxes, dispense salaries and welfare payments, if any, and to keep accounts of the city's funds (see Figure 14).

The community may wish to give the mayor additional powers to set city salaries, tax rates and welfare payments. The mayor may be selected by a variety of means:

1) By appointment of the teacher.

2) By General Election -

   a) Elections may be one person to one vote or by property owners only or one money unit to one vote.

   b) The children may elect a city council by a variety of schemes and have the city council select the mayor. If a city council is used, the children may wish to empower the council to set certain taxes, salaries, etc.

Taxes

A variety of tax schemes should be experimented with to ascertain:

1) Equal amounts for all;

2) Percentage of cash funds available at a set time;

3) A graduated tax on cash collected at a specified time in the dramatic play;

RESEARCH PAPER

BY: SHIRLYCE MANNING, AGE: 7

A tax is money people give for government services.

People vote for a tax law. The people share in paying for these things.

The owner of land gets a paper from the government ~~x~~ That tells about their taxes. On the paper it tells how much ~~they~~ you bought ~~their~~ your land for.

Who makes the laws? A council has a meeting and decides on laws for the community to obey.

FIGURE 12
33

Reporters LaRhonda and Stacy

Council Grove News
Pathfinders' Edition

This morning we did some thing like creative writing except we wrote essays answering the questions, "How should the policeman be paid?" and "Who should make the laws?" We had some pretty interesting answers. We took a vote about who should make the laws - Mr. Hanson?, Everyone?, The police?, The judge? When we had the vote everyone voted for everyone to make the laws.

At lunch time some people played games and some people painted the bakery goods and some people started with crayon makeing fish, then they put a blue paint wash over the fish for the water.

FIGURE 13

By Shawn Truby
Age: 7

Duties of the Mayor

1. Hire the health officer fireman, policeman.
2. Organize elections.
3. Select jurors.
4. Keep accounts of general funds.
5. Pay public servants.
6. Make welfare payments.
7. Collect taxes.
8. Listen to complaints.

FIGURE 14

4) A property tax based on area; value of lot at last purchase; or zone and size.

Subsidies

The creation of fire, police and health and education services as government jobs is a form of subsidy, since it reflects a lack of confidence that these functions are economically viable in the free market.

Typically, homemakers will find it very difficult to maintain their families. The children must measure the value of the home-making and child-raising function. Their evaluation will lead them to various schemes for supporting these functions, such as operating a part-time outside job. Question - How does this affect the quality of child rearing and health?

The children may find that they wish to offer subsidies to other desirable functions which cannot survive otherwise. The Council Grove children in one part of the program decided to pool all of their economic resources and operate them under a central political unit (see Figure 15).

Judicial System

There are two bases of law that ought to be considered: one is that of statutes. A statute once established, defines "crime" and "punishment". The second is arbitration, in which law simply provides a framework for the reasonable working out of grievances and reparations based on the particular situation.

In Council Grove, we found the children chose to develop statutes to regulate health, traffic and business, but found a more open-ended approach more suitable for social regulation. (See Figures 16, 17 and 18).

Council Grove News
Pathfinders Edition

By Dedee Galtney (Age: 8) and Nicole Johnson (Age: 7)

Today we did urban planning. Some people didn't have enough money so the government is going to charge higher taxes for the rich. The tax money will be used to pay the civil employees (firemen, policemen, health workers...) and housewifes.

We learned that our country has a representative government. That means we vote for people who make our laws.

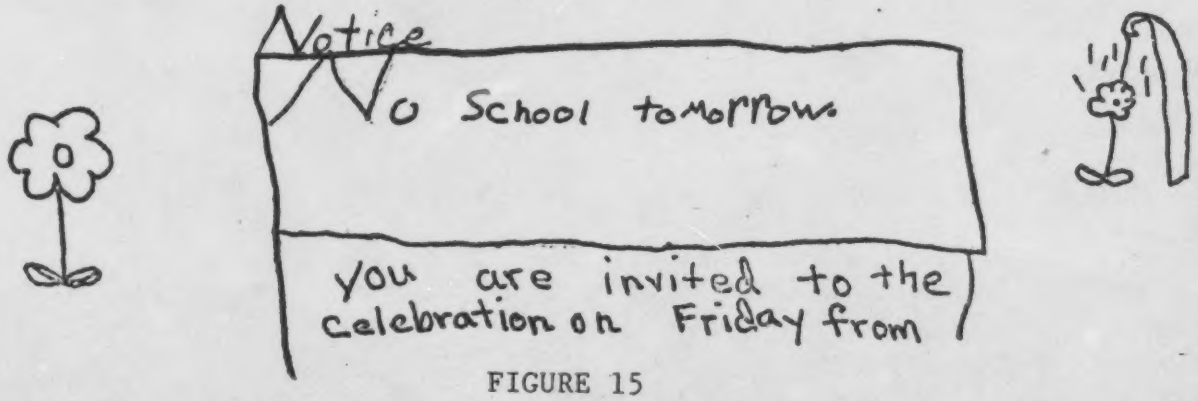


FIGURE 15

By: Nicole Johnson
Age: 7

Election Law

The Judge is elected as required, by a vote by secret ballot of the adult population. The mayor is elected as required, by a vote by secret ballot of the adult population. All adults are eligible to vote.

FIGURE 16

38

By: Shirlyce Manning
Age: 7

Duties of the Judge

1. Preside over criminal trials and appeals of traffic cases. In these cases the judge is responsible for following proper trial procedures and finding whether the defendant has broken an existing statute.

2. Hear civil suits.

In cases where one party feels injured by another and there is no existing statutes the judge may rule on the merits of each case and make a fair settlement.

FIGURE 17

Criminal Law

By: Nova Burch
Age: 7

1. There will be on stealing in Our Community.

2. There will be no Knocking down buildings or signs.

3. There will be no littering.

PENALTIES

1. Sit out the rest of the period.

2. Buildings - pay 15¢ to the owner or sit out 5 minutes.

The 3-person jury will be selected by the mayor when there is a request for a jury trial.

FIGURE 18

UNIT I

CONSUMPTION: THE HOME

Unit I begins the Urban Planning study with the conceptual area most immediately available to the child. Since children are not, by and large, productive members of society, their ideas about manufacturing, distribution and commerce are extremely vague. Children are, however, consumers, and this unit is designed to use their experience as consumers as a source of information, and to introduce them to basic research.

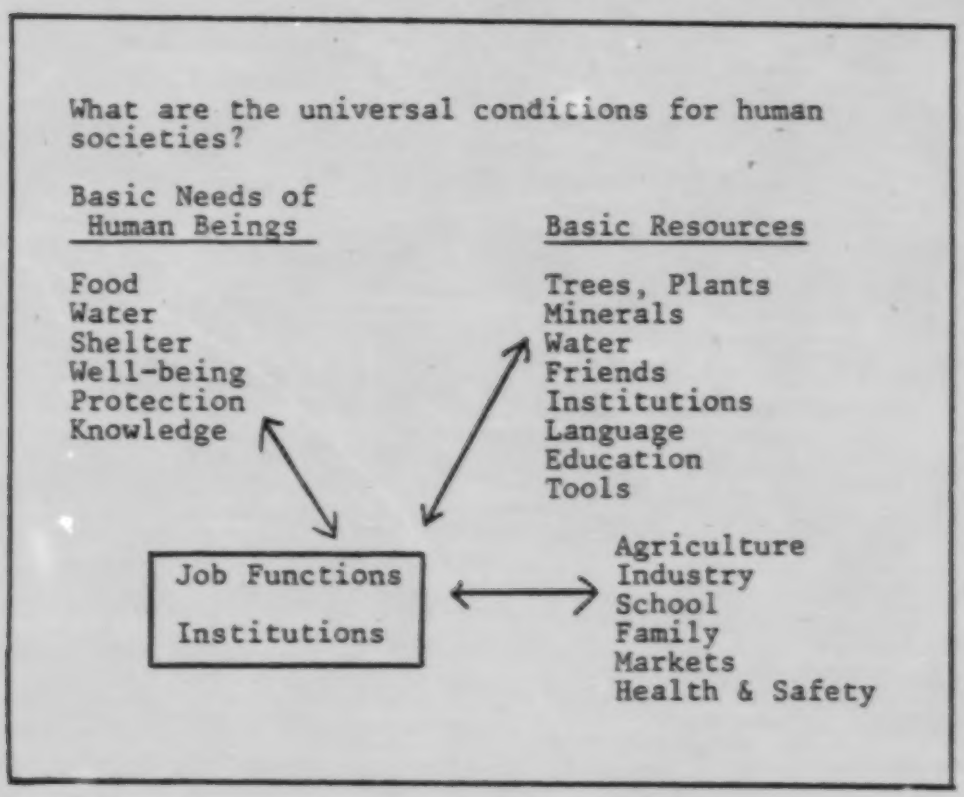
The home, in particular, is the focus of the child's life. Since it is also, for him, the center of consumer activities, the examination of the home is a method of illuminating many concepts about human needs and wants that is well suited to children's developmental level. It should be stressed that this study revolves around the '<u>Ideal Home</u>', not around any actually existing home. The children's actual homes are used as resources to provide information and insights into relationships from which to build their own models. The concept of modeling is central to that of planning, and it is important that the children become adept at reworking information and materials into new forms.

Unit I, Seminar I: Universal Human Needs

The purpose of this discussion is to bring out of the children's own experiences a set of things that all human beings need to lead a wholesome existance. Bread, therefore, would not be a universal need, but "food" would be. Rather than be presented with a list by the teacher, the students should make suggestions and criticize them until they have evolved a list of basic needs, as the process of abstracting generalities from particulars is as important as the list itself. On the other hand, the teacher should be able to guide the discussion toward topics that the children have not thought of. Here is a list of what we at Council Grove III believe to be universal human needs:

Food	Shelter	Knowledge
Water	Companionship	Affirmation

Below is an example of a Study Print handed out to the class:



Unit I. Seminar II: Ideal Home

The first topic of this discussion is the idea of a model or the "Ideal". The children should understand that the Urban Planning Study, while it draws information from real urban communities, especially their own, is not simply a study of a given community. Rather, it is a study of a model or ideal community, not in the sense of being a perfect community, but in the sense of being abstracted from many communities. It reflects the essential relationships within an urban ecology, rather than the historical relationships of a given city.

The troglodyte dramatic play they have just engaged in is an example of modeling - in this case the children are themselves a model of early man. Does this mean that they were just like troglodytes? Of course not, they simply attempted to model, and thereby understand, the most important features of troglodyte life.

In the same way, the entire Urban Planning Study will be used by the children to model their ideas about their community in many ways. They are not trying to recreate their own city, however, but are using these models to test ideas, ideas that can be used to plan and improve communities.

The second topic of the discussion is the Home. For the child, home is where most of his needs are met. It is the center of consumption, and is readily examined and researched. The children should discuss what things they feel they need and want in their home - their own room, a TV, a refrigerator, a painting. Different kinds of needs can be brought out, and each of the

children's wants can be related to the Universal Human Needs listed in Unit I, Seminar I.

The third topic is research. Research will be very important in the study. There are two kinds of research - first hand and second hand. They will begin with first-hand research, by polling their own families about what they think belongs in their Ideal Home. The teacher must prepare a questionnaire to be sent home with each child. This is Unit I, Research I.

Unit I, Research I

This project is directed toward introducing the children to research, to involving the parent-body in the study, and toward developing the ability to work independent of the teacher.

A sample questionnaire is reproduced here, along with one child's responses. The children in this instance were encouraged to get their parent's help, and the help of the rest of their family in filling out the questionnaire. If this procedure is followed, most children will move on their own toward greater and greater input of their own, but some will require criticism to prevent continued dependence on parent help.

In critiquing these questionnaires, several things should be looked for. First, a multiplicity of detail is commendable, as is a fair amount of practicality. This is an Ideal Home, not a fantasy. Second, supporting reasons for choices are important.

Study Sheet and Survey on Ideal Home
Unit I, Research I

Answers By:
Nicole Johnson
Age: 7

"Ideal" is a word that comes from the word "Idea", which means a "thought". So, an Ideal Home is one that exists in your thoughts. It is made up of your ideas of what a home should be like. This survey is to find out what the class and their parents think a home should be like.

You should take this survey home and think carefully about it. Then write down, or have someone at home help you write down, the things you want in your Ideal Home. Also, ask your family what they would like in an Ideal Home. Write these ideas down too. Here are some questions to help you think about the problem. First think about what you really need in your home.

How big a home does your family need? Why? one for ~~a~~ each family and guest.

4 bedrooms

What functions must your home serve? It keeps you warm in winter and dry when it rains, and gives you a place to sleep.

What else do you do at home? Read, study Play, clean-up, watch t.v., Play records.

Does each activity need a separate room?

no

What do you need inside each room? What do you need in the kitchen? Dish Washer cabinets, clocks Table chairs Sink

What do you need in the living room?

Couch Chair, Table, Sterea chandelier

What do you need in the bathroom?

Bath tub, Sink, toilet Shower

60

Other rooms? family room Study room

tv, sofa table lamp chair Books Desk

So far we have asked what you need in your home. Now it is time to think of what you want in your home. Go back over the questions and see what you would like to add to each part to make your home the way you want it.

Swimming pool, Playroom, Pictures, pets

Unit I, Cartography I: Listing Needs

As an introduction to Cartography, the children should first be told the meaning of the word. Then it should be pointed out that there are many different kinds of mapping that will be studied in the course of the year, and of course some that will not be studied. Besides road maps or other plan views of geographical features, there are architectural drawings, reports, sketches, artwork of all kinds, flow charts, stories and photographs. Some of these map physical objects, while others map what is occuring in an artist's mind. The discussion during the planning period should encourage children to mention particular kinds of maps, and to tell what they map.

The first mapping project is itself simply a listing of needs. First each child should make a list of Universal Human Needs from the Unit I, Seminar I. Then they should build upon this list to include the particular things they need to fill each of these general needs. Do not expect any exhaustive expositions. (See Figure 19.)

By Nicole Johnson (Age: 7)

I need: a book-shelf, a bath-tub, clock, dresser, books, Stove, refrigerator, calender, games, bed-room, Swimming pool, chair.

FIGURE 19.

Unit I, Cartography II: Family Graphs

Using the information gained from Unit I, Research I, the children should make a series of graphic representations.

(1) Family Graph - This graph should be executed on graph paper. It simply shows each member of the child's family or household, and their relative heights. Stick figures, fuller drawings or even labeled bar graphs are possible. Each figure should be labeled, and the whole captioned. (See Figure 20.)

(2) Home Diagram - This is a diagram of the rooms the child believes are necessary in his Ideal Home, and their significant contents. All should be labeled.

(3) Needs List - This is simply a list of those things the child wants or needs in his Ideal Home.

In the Evaluation period the different kinds of graphs should be compared for their different abilities to represent various information. Also, the products of various individuals should be compared for completeness, aesthetic quality, accuracy, and different techniques of representation.

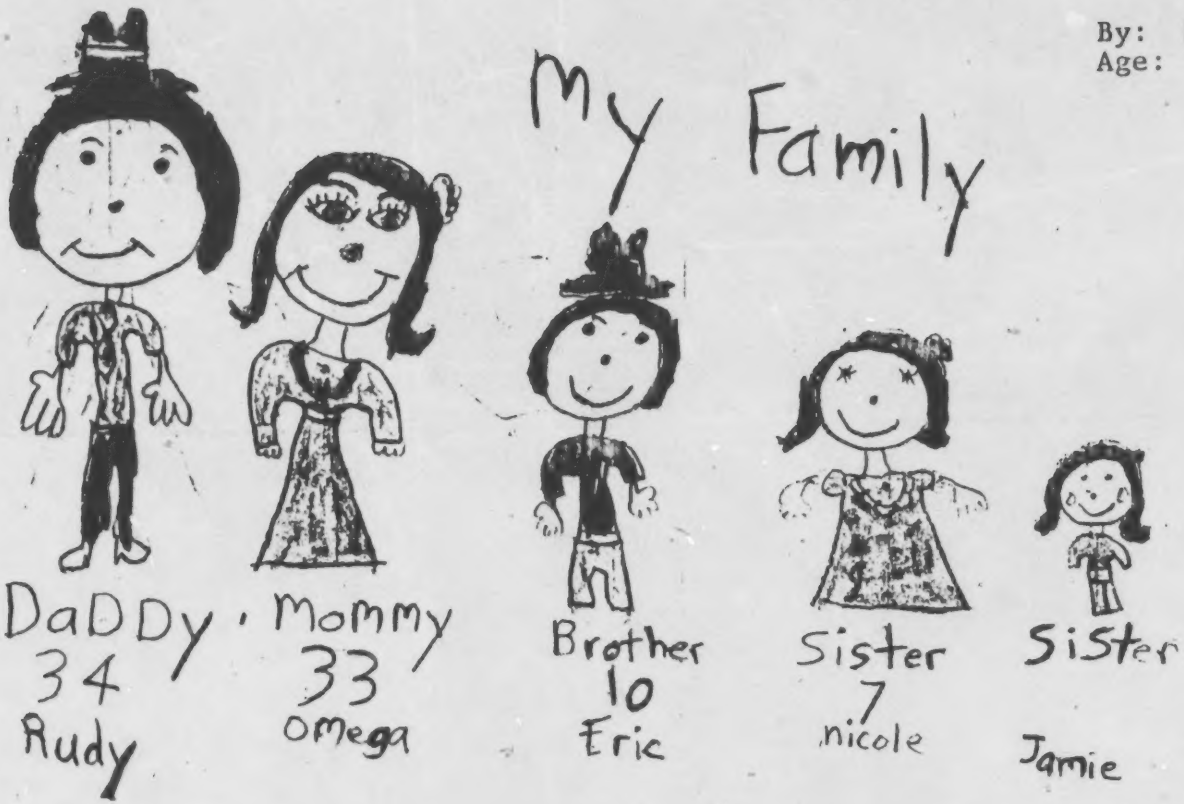

By: Nicole Johnson
Age: 7
My Family
DaDDy
34
Rudy
Mommy
33
omega
Brother
10
Eric
Sister
7
nicole
Sister
Jamie

FIGURE 20

51

Unit I, Dramatic Play I: Early Man

In the planning period the teacher should present some information on paleolithic peoples. This need not, should not be very detailed. The main purpose is to emphasize that in this Ideal dramatization, the children will be faced with solving all problems from scratch, they cannot rely on any foundation of technology. In addition, the teacher should provide a particular image of a geographical and climatic setting.

The children, in groups of about eight, will play out their ideas of how such people might go about meeting their Universal Human Needs. While they do this, the other research groups will watch, and attempt to take notes. After each performance, there should be a brief discussion and critique, with the children and teacher pointing out successful problem solving and such problems as style, leadership, anachronisms, and cases where the actors have ignored the conditions set for them by the teacher.

Each group should naturally benefit from the mistakes and succeses of its predecessors. Early groups may wish to have another try after they see the way other groups have solved problems they were unable to.

The major goals here are to familiarize the children with putting themselves in the positive of someone else, of being able to abstract themselves into some invented setting and remain within the restrictions of that setting. Secondarily this exercise should serve to reinforce the content of Unit I, Seminar I.

UNIT II

HEALTH AND WELL-BEING

This unit examines the question of human needs from a slightly different perspective. The Ideal Home unit takes an essentially individual look at needs and wants. The current unit seeks to broaden the child's perspective from that of self or family to the community. In terms of job functions, the Health Department and the Fire Department should be the focus. These organizations are devices that communities create to protect the community's health and well-being where individuals would be ineffective.

Two aspects of this should be dwelled upon: First, people living in a community have responsibilities to the community - a person with poor sanitation practices endangers the well-being of others. Thus the community becomes an entity in its own right, apart from the individuals in it, for though a person has the right to be ill if he really wants to, he has no right to endanger others. In many cases these others cannot be specified, though a general danger to the community can be seen to exist. Second, in many areas social action simply reduces the cost - in labor, money, danger, time, etc. - of accomplishing something. The cost for each family to provide themselves individually with adequate fire protection would be phenomenal, assuming that every family had the know-how to do this. The same is true with health services.

Unit II, Seminar I: Health and Well-Being

The purpose of this seminar is to establish a broader conceptualization of the ideas of health and well-being, built on the concepts of human needs already studied. (See Figure 21.)

In the discussion the class should be asked to define health and well-being, and to put forth ideas of the necessary components of these conditions. In the discussion health should not be viewed as an optimal physical condition, but as a combination of positive conditions within the categories listed as basic human needs. Can a person be healthy or enjoy well-being without affirmation? What are the aesthetic components of well-being? The notion that 'man does not live by bread alone' is an important one. The question of relative well-being should also be discussed. A person on a diet of brown bread and tea may consider himself well-off if those around him are eating brown bread and water, but in a social environment of roast-beef sandwiches and vegetable soup he is likely to revise his concept of his own well-being downward.

COUNCIL GROVE NEWS

PATHFINDERS' EDITION

Yesterday the Pathfinders continued their study of Public Services by examining the Fire Department. After discussing many uses of fire in and outside the home, the class divided into groups for research and construction projects. The construction groups first drew plans for the objects they would construct.

After P.E. the construction groups built a Fire Station and its furnishings, and began to build two fire trucks. The Science committee did some experiments with fire. They discovered that fire cannot burn without oxygen from the air. Nova deduced that when one blows on a fire it gets hotter and higher because one is blowing more oxygen on it.

Today the class made oral and written reports on Monday's activities. Some wrote step-by-step descriptions of what they had done, while others made charts or tapes about what they had learned.

At the reading period, some people were given new books. Their reading program will be explained in tomorrow's paper.

FIGURE 21

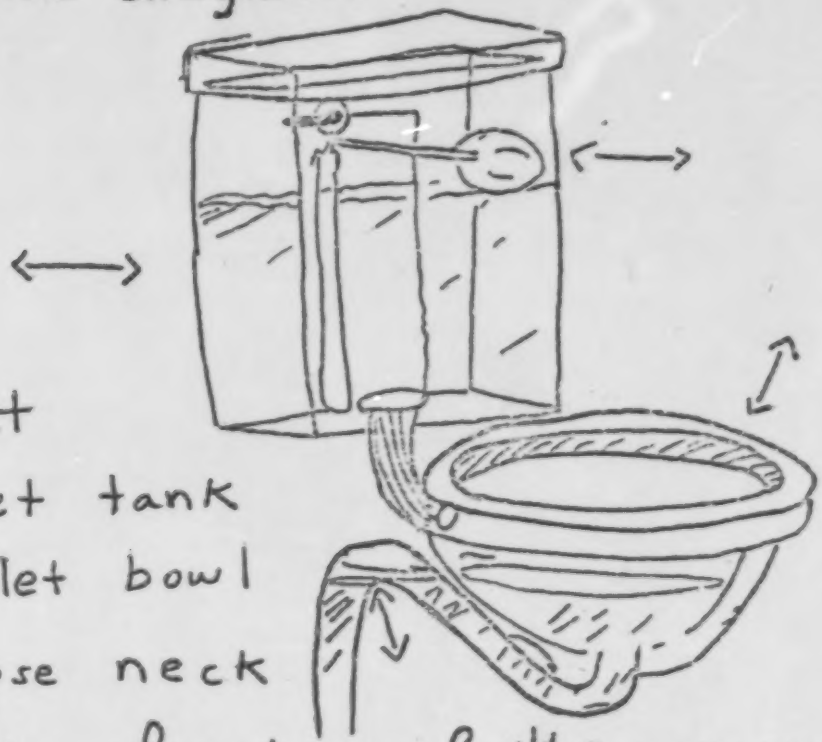
Unit II, Seminar II: Social Aspects of Well-Being

Thus far the various definitions of needs, wants, health and well-being have focused primarily on the individual. Man being a social animal however, and the particular methods and means of meeting human needs being made possible only through this social interaction, it is important to make a social as well as an individual definition of well-being.

In studying the Health and Fire Departments the children have learned about measures they can take to protect their own well-being. Suggest this problem to them: They own a home. They are very neat and take all reasonable precautions to protect their own health, and the aesthetic quality of their immediate environment. Their neighbor, however, raises pigs in his back yard. The yard is several feet deep in mud and manure, the stench is over-powering, the noise of squealing porkers can be heard for a block in any direction, and an enormous cloud of flies darkens the skies over the whole area. How are they to secure their own well-being in such a situation? What responsibilities do their neighbors have? What other areas can they think of in which the individual cannot effectively secure his own well-being, or do so only at enormous cost? What social solutions to these problems are available? What costs, both material and social, do these solutions entail? For instance, to what extent should a Sanitarian's right of inspection be allowed to infringe on a market owner's rights of privacy and property? Would it be the same extent in the case of a private home owner? (See Figure 22).

Exam: Urban Planning Study
Residential Functions
October 10, 1977

1. Examine diagram #1. Describe the various parts of a flush toilet by placing the letter of the correct term on the diagram.



A. Float
B. Toilet tank
C. Toilet bowl
D. goose neck

2. What is the <u>function</u> of the gooseneck part of a flush toilet? (choose only 1 answer by circling one of the letters shown below):

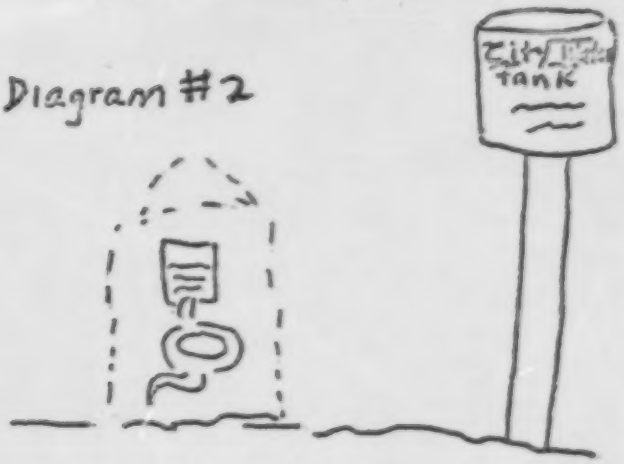
A. to put water into the tank.
B. to trap bad odors.
C. for decoration.

FIGURE 22a

3. In diagram #2, the toilet tank is at a lower level than the huge tank that holds the water supply for an entire town. Can the toilet tank in the house be re-filled with water when the toilet is flushed?

Circle only one answer; Yes No

Diagram #2



Now write out your reason for your answer:

4. Which has more viscosity-water or syrup. (circle one).

FIGURE 22b

Study Sheet and Survey on Fire Safety
Unit II, Research I

Answers By:
Nova Burch
Age: 7

The Fire Department is an organization that helps protect the public. Like the Health Department, the Fire Department exists to help people where they cannot help themselves. If your house caught on fire you probably could not put it out by yourself. On the other hand, both the Health Department and the Fire Department need your help to protect you and to protect others. Last week we discussed some of the things each of us can do to protect our health, our families' health, and the health of others. Washing our hands, keeping food properly protected from pathogens and eliminating pests are some of the ways we can protect our health. This study sheet is to help each of you think of ways to protect yourself, your family and your community from fire dangers.

We discussed how there are good bacteria and bad bacteria. There are also good fires and bad fires. A fire that destroys your home or kills or injures someone is a bad fire. The fire you cook your food on is a good fire. Think of some fires you need to have in your home and write them down. fireplace and a stove and a furnace for heating your home.

Think of some areas outside your home where fire is used and write them down. Campfire (industry) farm Land

We can see from this that there are fires all around us every day. Most of these are very safe fires, and ones that we would have a hard time doing without, but we can see the importance of keeping fires in their proper places. Besides fires that already exist in your home, what things could start a fire that might destroy your home? careless use Cigarettes and matches Ignter flames Cooking Grease

Now that you are aware of the dangers, try to think of some things you can do to keep your home safe from fire.

1) In the kitchen: keep the fire down in the stove Turn the kitchen fire off when you throug cooking.

2) In the basement or garage: Don't Leave the oil cans out in the heat.

3) In the rest of your house: Make sure your Cigarettes are Out.

Your parents pay taxes to support the Fire Department in your community. If your home is safe from fires, why should your parents pay money to the Fire Department?

If others are careless this affects ~~for~~ you.

Unit II, Research II: Environmental Health

The children should poll their families on their concepts of well-being, in a broader sense than that incorporated in the Ideal Home Survey. This should be done by means of a teacher-generated survey, as homework.

Study Sheet and Survey on Environmental Health
Unit II, Research II

Answers By:
Christine Craig
Age: 8

The Health Department is divided into two sections. One section focuses on the treatment and cure of deseases, while the other focuses on the wholesomeness of the environment. Our study of the Health Department will focus on the environmental section.

In class we will discuss the questions and concepts printed below. Take this sheet home with you and discuss it with your family. Then fill in the answers and return it to school tomorrow.

(1) What does wholesome mean?

Healthy

(2) Food is one part of our environment. Think of some wholesome foods and some unwholesome foods. What makes food unwholesome?

Germs

medt is wholesome, fruit is wholesome, Vegetables are wholesome, candy is unwholesome

(3) Other things that can effect our health and well-being are dirt and filth around us. What are some of the ways dirt and filth can effect our health?

dirt and filth carry lots of Germs that makes us sick.

(4) On the other hand, dirt is very necessary to our life. Name some areas in which dirt is useful and helpful to us.

Gardens Nursery plants inside and outside.

(5) Air and water are both essential to life. When they are polluted they effect our well-being. What are some of the things that make air unwholesome?

Smog
trash oil Waste

What are some things that make water unwholesome?

trash
Gasoline
Oil
Sewage

(6) There are many kinds of sounds. The ones that are loud and irritating we call noises. When there are so many of these noises that they effect our well-being, we call this "noise pollution". Think of some noises that disturb you, and how they effect your well-being. loud music
trains
airplanes

(7) Sounds can also be beneficial. List some sounds you want in your environment. radio, telephone, birds singing, t.v., records, singing

(8) Would your environment be wholesome without any sounds? Why? no. It wouldn't be life and it wouldn't be good for us.

(9) Some other things that effect our well-being are pests. Name several kinds of pests. How does each one effect your well-being? roaches, black bees, mosquito, rats because they bite and carry lots of Germ

(10) Why do we have an Environmental Health Department?

(11) Why not let everyone take care of their own health and well-being? because if we were sick, we wouldn't know what to do to make ourselves well, again.

(12) List some other organizations that protect the public.

Fire station
police station
Hospital
Health Center

Unit II, Cartography I: Mapping a Wholesome Environment

The children should choose one or both of two ways of mapping an ideal wholesome environment: 1) Description - they can write a list, story or other verbal description of the things and activities they think belong in a wholesome environment; or 2) The children can draw a map of a wholesome environment. As few restrictions as possible should be placed on either the content or the format of these maps, however, the teacher should suggest various possibilities of scope (physical, social, home, neighborhood or town) and various graphic approaches (use of symbols, labels or pictures, distortions of scale and use of legends) to explain map symbols and what the map is about. This is a project that can be repeated as the children's cartographic and social science skills improve.

Unit II, Cartography II: Map Symbols

The teacher should collect a wide variety of maps that use as many different types of symbology as possible. With the class as a whole, or in committees, the teacher should work with the students to learn to read the various kinds of symbols used, and to learn to correctly use a map legend. All cartographic features should be pointed out, but many, such as longitude and latitude lines, should be de-emphasised. Mastery of approach rather than mastery of content should be stressed.

After the class has shown a good ability to decipher various kinds of maps, the teacher should distribute them to small committees so that each group can make a list of symbols used on their maps. These lists should be reviewed by the groups as a whole, and a master list of map symbols drawn up.

Unit II, Cartography III: Map Symbols B

From the master symbols list from Unit II, Cartography II, the class should develop a new list - this time one that includes what they think are useful, easy to read and easy to use symbols for them to use in the next map project. If there are no symbols on the master list to represent items they wish to represent, they must invent them. Clarity and simplicity must be the guide here. Included is a list of suggested symbols for the list. Symbols should be included for all significant types of terrain, as well as various products of human endeavor - towns, roads, bridges, cities (see Figure 23).

Council Grove News
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Today in reading, Loretta finished her book and she is in the library reading program. In cartography we drew a town. It had a forest, a river and a farmers field. We learned new symbols. One of the symbols is this: ≡≡≡ = swamp.

In P.E. Mr. Hanson taught us how to play soccer

One rule is you can not touch the ball with your hands.

Group A should Study X tables at home every day

Reporter: Shawn Truby
Age: 7

FIGURE 23

UNIT III

COMMERCIAL ENTERPRISES

From the identification of needs the most reasonable step is to examine how they are satisfied. For the child, the immediate source of goods which satisfy physical (and many other) needs is the retail enterprise.

Commercial enterprises are those engaged in buying and selling: in trade. In our system almost everyone is engaged in buying and selling, but commercial enterprises are those whose sole or primary function is exchange, not consumption or production. Commerce thus forms the first level of social interaction. It is through commerce that society maintains the distribution of necessary and unnecessary goods that keep society running. The most visible aspect of running the job functions in the Urban Ecology Tool Map is the commercial aspect, so a detailed study of trade is essential to progress in that area.

Unit III, Seminar I: Where Do We Get The Things We Need?

These major concepts and definitions should be established in this seminar:

(1) The distinction between consumption, production and commerce exchange. Consumption is the activity of using goods, production is the activity of creating them, and commerce is the activity of exchanging goods of one sort for goods of another sort. Children should group various functions and enterprises according to this taxonomy.

(2) Distribution - Commerce, or exchange, is simply one form of distributing goods and services. What others can the children think of? Sharing, forced expropriation, a directed economy are some methods that ought to be discussed briefly.

Unit III, Seminar II: Money and Barter

Barter should be the first topic of discussion. What is barter? Since barter is the exchange of goods without the use of money, is it a commercial activity? What instances of barter can the children think of from their own experience? Trading sandwiches, baseball cards etc.

Barter can then be compared to sharing as a method of distribution. Which is likely to be more equitable? Which is likely to be more fair? Do the children define fairness around the issue of meeting needs, or around the idea of equal pay for equal work? How do problems like physical or mental handicaps effect the fairness of these systems? How do the ordinary variations in human abilities, needs and dispositions effect the fairness of these two systems? What problems of organization or enforcement might one encounter in either of these systems?

Money needs to be carefully defined. The children should be allowed to first make their own observations on the nature of money, but it is important that the teacher establish a truly useful definition. At Council Grove III we define money as a representation of value. Money does not directly meet human needs, except in the case of misers, etc. It is simply a medium of exchange. Since it is only useful as a medium of exchange, it must represent something or things that have immediate usefulness.

Since money is not itself useful in satisfying human needs, why is it used? The discussion should cover the following points:
(1) Versatility - A man with apples wishing for shoes must find

a man with shoes wishing for apples if he is to barter, or else pursue one or more intermediate transactions to acquire the commodity that the shoe-holder has. In general, money guarantees that the holder will able to purchase the goods he wants from whoever has them.

(2) Consistency - Currency establishes a standard of exchange more readily than barter. The money unit can be used to measure the value of all commodities, where as it would be tiresome to measure all goods' worth directly against each other.

(3) Divisibility - It is very difficult to make change for a cow. Money offers more flexibility in the size of units to be exchanged.

(4) Preservability - Money can be handily stored, whereas many goods and all services suffer from the passage of time.

(5) Transportability - Money is very compact, allowing great wealth to be accumulated in one place or on one person, and allowing it to be moved about easily. Contrast this with living in Kansas with a fortune of 50,000 tons of wheat and wanting to move to New York.

The use of money and barter may be contrasted in the same manner as sharing and barter were, or all three may be compared together.

Study Sheet and Survey on Trade
Unit III, Research I

Answers by
Natheal Paggese
Age: 8

For various reasons it is rarely possible for a person to produce everything that he needs. Because of this people must find ways of distributing the things they make.

In some primitive societies people simply share what they have with others who need it. In Australia, where game is very scarce, the hunters in a tribe all go out in different directions. Many of them return at the end of the day empty handed, so the other hunters share their catch with them. No one knows whether he might come back empty handed the next day, but since they share they can usually count on getting a meal.

In most societies, though, people make things, or catch or grow them, and exchange them for other things they need. When they exchange them directly - a pound of apples for a quart of milk, three goats for a calf, it is called Barter. What advantages does Barter have over sharing?

* Advantage of barter Over sharing is that one is able to exchange one good One they need where for sharing one shares what he has Some and get nothing in return.

In most modern societies goods are no longer exchanged by Barter. Money is used instead. Rather than trading a basket of pears for a shirt, a farmer would sell his pears for, say $10.00. Then he would buy a shirt for $10.00. One advantage that the use of money has over Barter is its versatility. If you have oranges and want tennis shoes you need to find someone who has tennis shoes and wants oranges in order to make a trade. But with money you can sell your oranges to anybody who wants them, whether they have tennis shoes or not. Then you can use the money to buy tennis shoes from anyone who has them, whether they want oranges or not. What other advantages does the use of money have over Barter?

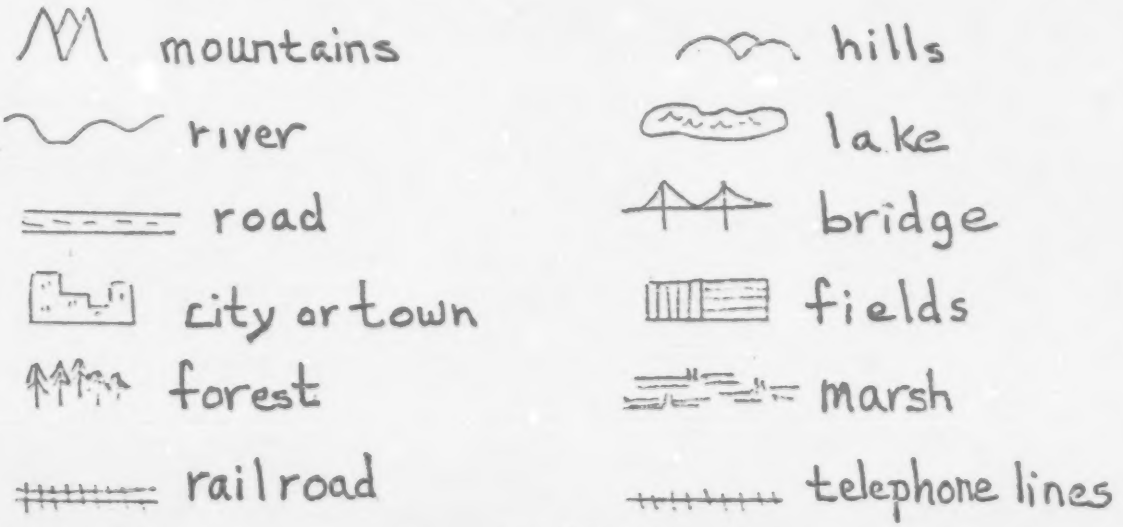
The advantage money has over barter is you can buy what you need instead of trading something for what you want.

Unit III, Cartography I: Fantasy Map Trip

The Fantasy Map Trip is designed to introduce the children to map symbology and to reinforce their concepts of direction and distance. Each child should have his own piece of paper and a pencil or marker.

The teacher may either develop the trip ad hoc or work from a map he has already prepared, but which the children may not see. The first step is to describe the function of a map legend. The legend explains what the map is about, and the symbols used for representing various things and features. The legend is a key to help other people read the map. Note: this first trip is made without introducing the idea of scale, although if a student brings it up, it is wise to discuss it briefly. Scale will be treated more fully later.

The teacher should present, and draw on the board, the following or a similar set of map symbols and their explanations:



The teacher then explains that they are going to go on a trip and make a map of what they see. They live in a small village, which they should place in the center of their paper, and the teacher will tell them what they see and do on their trip. They will use the symbols on the board to represent these things on their maps.

Then the teacher chooses some direction to go, and begins to tell a story about the journey: which way they are going, how far, what they can see to either side or ahead of them such as rivers, mountains, fields, forests, lakes. Separate trips may be made in different directions from the village to fill in the map. Then the children should compare their maps, with each other and with the map the teacher has worked from. This will undoubtedly bring the question of scale to the forefront, as some children will not even have room on their maps for all the features, from working too large, while others may have masses of empty space around the periphery for the opposite reason. Things are not likely to be in the same relative positions to each other either, whatever the scale, as no method defining distances within the map has been established (see Figure 24).

My Fantasy Map Trip

John Tyler

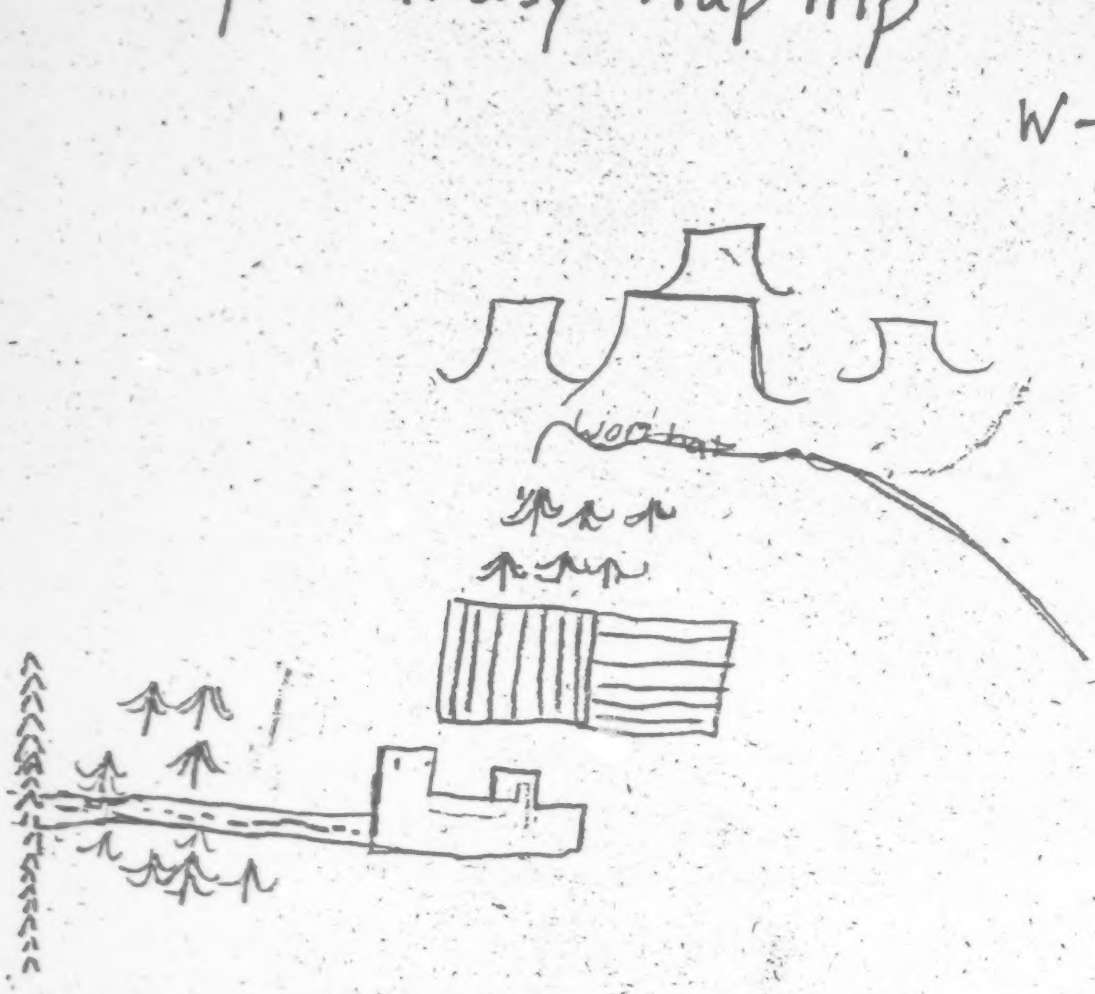


FIGURE 24

Unit III, Cartography II: Sandbox Map

The teacher should first present a short lecture on geology; noting the different kinds of major formations that occur, and in what combinations they are likely to occur. Large use of pictures should be made, to give children a visual impression of terrain they may not be familiar with. Remember, many inner-city children have never seen lakes, rivers, mountains, etc.

The class should then proceed outdoors and build a map of any terrain they choose in the sand. Committees should be organized to work on specific areas and/or on specific types of terrain, to insure a well-made and varietous product. The class should then critique its own work on questions of scale, realism, aesthetics, etc.

Unit III, Cartography III: Sand to Paper

The basic idea here is to see if the class, or members of the class can first accurately map on paper the features they have constructed in the sand. After attempting to do it free-hand the teacher can suggest various aides: 1) Grids - Both the sand and the paper may be divided into squares. This will help prevent major distortions of scale. And 2) Symbols - Depending on the type of terrain being featured, different kinds of symbols may be appropriate. For instance, if the entire map is of one large and multi-featured mountain, a realistically representative form might be best, whereas if the terrain in question is a vast expanse of small mountains, plains, rivers and lakes, the use of very abstract symbols such as those used in the Fantasy Map Trip may be more appropriate. And 3) Perspective - Different types of maps will result depending on whether the child uses his actual, ground level or slightly above perspective, or abstracts his information to form a birds-eye view perspective.

Unit III. Cartography IV: Sand to Paper to Sand

Using the techniques developed in Unit III, Cartography III, the children will attempt to create terrain, map it, and recreate it from the map.

For this project the class should be divided into three large committees. Two will be engaged in other pursuits, such as research projects, while one works on the map project.

The first committee will create a map in the sand of various kinds of terrain. This should be a map which includes many different kinds of terrain, as, for the first run-through at least, success will be much more likely if abstract map symbols are possible.

The second committee's task is to, either singly or in groups, depending on their skill and self-confidence, reproduce the sand-box map on paper, as accurately as possible. When they are finished they should obliterate the sand-map.

The third committee's task is to recreate the map in the sand box, using only the map or maps of the second committee as a guide. When they are finished the whole class should view and critique the work of both the second and third committees.

UNIT IV

TRANSPORTATION AND NETWORKS

This unit, besides dealing with the job functions involved in moving people and goods from one place to another, approaches the concepts of communication and networks. In terms of the consumption-commerce-production chain, transportation is the link between producers and retailers.

It is hoped that the children will see that communication and transportation are not discreet acts, unconnected with similar acts. While it is possible to view transportation from the perspective of moving a given unit of goods from point A to point B, the socially relevant aspect of transportation transcends these individual cases. Even in an area where, for instance, dozens of individual truckers moved dozens of different kinds of goods for dozens of manufacturers, a network has been established. The roads and highways form the physical basis of this network, they both permit and restrict transportation. Generally, <u>patterns</u> grow up in such areas whereby some truckers will deal with certain firms, or certain routes or certain areas. Many of these arrangements are due to the physical compatability of certain goods to specific conveyances, others are based on economic or cultural considerations.

Unit IV, Seminar I: How Do Things Get From Where They Are Made To Where They Are Used?

The first topic of discussion must be that things are indeed made in places other than where they are used. An example from the home is food preparation: most families eat in a separate room from the kitchen, and must carry the food from one to the other. As the methods and products of production become more sophisticated, the physical separation of manufacturing from use tends to become more common and of larger scale. The production of coal and other natural resources is limited by their natural availability - thus anyone wishing to use coal in Idaho, which is unable to produce significant amount of the material, must have it moved from someplace where it occurs naturally. Other reasons for the separation of production and consumption will be dealt with in the Agriculture and Manufacturing Unit.

Once transportation is established as necessary, the children should list the types of transportation known to them, and the teacher should supply any deficiencies. Of the basic types: Air, Rail, Ship, Truck, Car, Bus, Foot, Bicycle, Pipe Wire; which are suitable for transporting particular things - grain, people, information, etc.; for various distances - around the block, interstate, trans-Atlantic, cross-town; and in various quantitites - for the consumer, for the retailer, for manufacturers. Factors to be considered in evaluating the suitability of a given means of transportation under certain conditions include: cost, safety, time available, pollution or other side effects, cost of ancillary facilities such as breakwaters or highways or toll-bridges.

Unit IV, Seminar II: Networks

This is an important sub-unit, as it graphically defines the concepts of networks, inter-dependency, variability, division of labor and specialization.

From Unit IV, Seminar I, it should be clear that the cost of moving produce from the farm to the city by truck would be prohibitive if each farmer had to bear the cost of a truck, building and maintaining his own road etc. However, produce is not the only thing to be moved by truck, and there's more than one farmer. If highways can be constructed through cooperation and pooling of resources of all those growers, truckers and manufacturers that need to have their products moved in various areas, the cost becomes more reasonable to each individual, and less duplication of services is necessary. If, further, those consumers who rely on this transportation system are assessed part of the cost of building roads and bridges (the necessity of transportation being as much a function of the consumer's location as of the producer's) then the cost to the individual would become even smaller. Thus, because of the continuing need for certain kinds of transportation, transportation networks are constructed which have an existence beyond the particular acts of transportation they are used for.

This discussion should bring out the variety of facilities made necessary or desirable by the transportation needs discussed in Unit IV, Seminar I, and should show how these facilities connect together the different parts of the economy. The emphasis here should be on function, the conceptual problems of this interconnectedness will be brought up in Section V.

Study Sheet and Survey on Transportation
Unit IV, Research I

Answers by:
Christine Craig
Age: 8

In the first part of our Urban Planning study, the Habitat study, we looked at what people need and want in their home environment. In the Manufacturing & Agriculture study we found out how some of these things are made. In the transportation study we will find out where things are made and how they get from there to where they are used to meet people's needs.

1. Some things can be made more easily in one place than another. List some products, tell where they are made, and try to explain why they are made there instead of somewhere else.

farms are in the country, because its not enough roo
in the city.
Stores are made in the city, because they get a lo
of business.

2. List several different kinds of transportation:

trains
Airplanes
buses
cars
campers
trailers
trucks
boat

Cont.

3. Why are products transported by different methods?

because if milk wasn't delivered in a milk truck it would get spoiled.

A transportation network carries many different kinds of products. It also carries culture. By sharing the products of their labor people from different areas share parts of their way of life-the way they think, what they eat or wear, [redacted] the things in their physical environment.

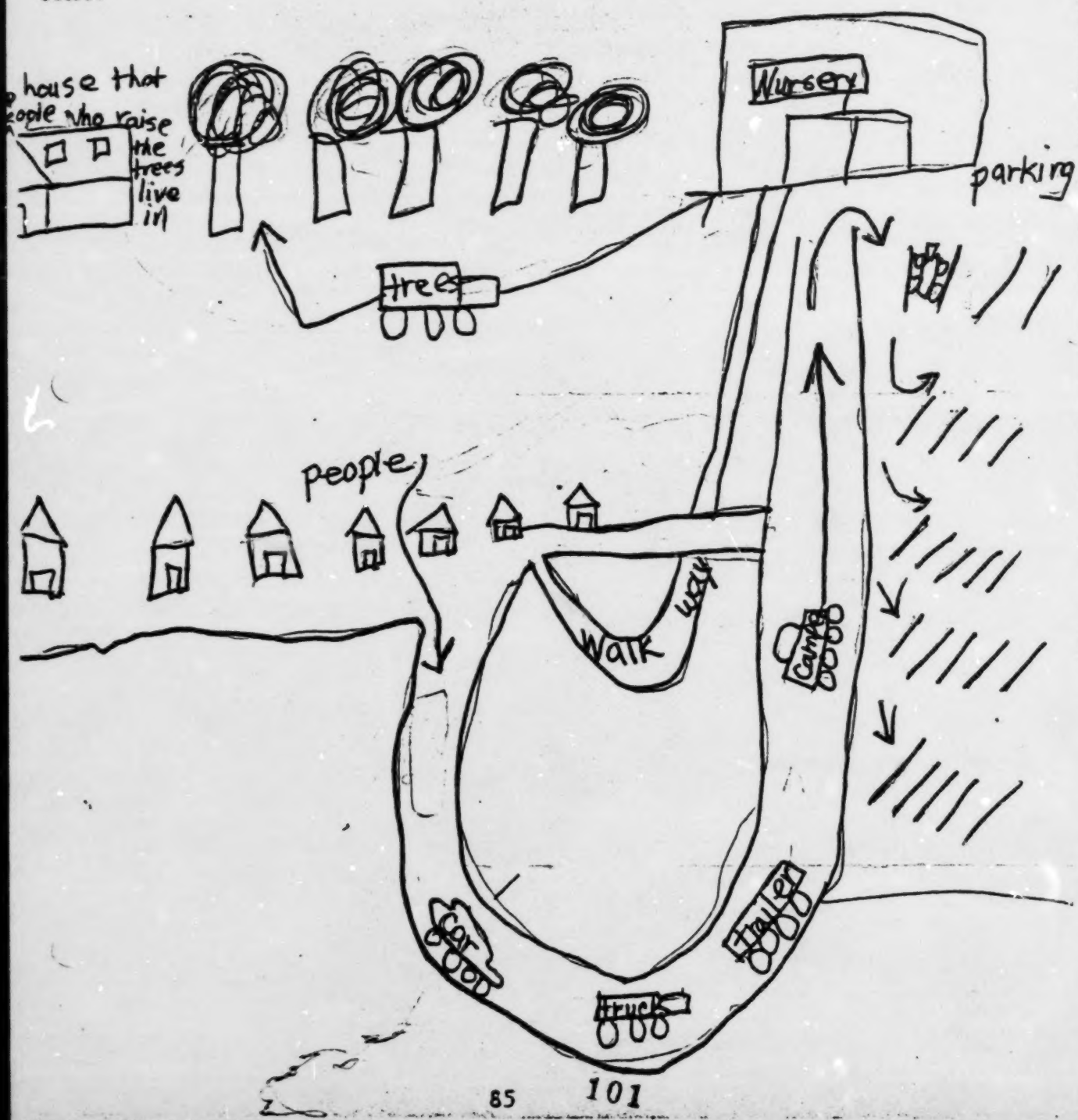
4. List some <u>imported</u> things you use, and tell something about where they come from:

My coat was made in Hong Kong.

5. Make a map of a transportation network. Label each kind of transportation, the places it goes and the products it carries.

Cont. on next page.

Cont.


house that people who raise the trees live in
Nursery
parking
trees
people
walk way
Camper
Car
Hauler
Truck

Unit IV, Cartography I: Routes to School

In this project, preferably given as homework, the children attempt to map as accurately as possible their route to school, without relying on any other maps. The object is in part to develop their ability to measure or approximate distances. Directions is also an important feature of this map.

To save the trouble of later recopying all the maps to the same scale, it is suggested that the children work on graph paper, all of the same grid-size, and agree on a common scale before hand. 10 feet = 1/8 inch is useful if the children all live very close to the school, 50 feet = 1 centimeter may be preferred for a more dispersed population, two maps in different scales may be necessary for children who are bussed long distances.

In the class, the quality and workmanship of the children's maps should be compared, and corrections made using a street map.

Unit IV, Cartography II: Combining Routes to School

In this project the children simply combine all of the maps that they have separately made showing their routes to school into one large map showing all their routes to school. This is the reason for having them all work in the same scale in Unit IV, Cartography I.

For this project the teacher should prepare a large piece of butcher paper, approximately 2'X3', with a grid laid out on it. If one wants the combined map to be ten times as large as the originals, and the originals are done on centimeter paper, simply mark out grid of squares ten centimeters on a side. By carefully following the grid each child should be able to copy the information from his small map to the larger one with no serious distortions.

The result will in most cases be a fairly complete map of the area immediately surrounding the school, getting progressively sketchier as one moves farther from the school. How can the children explain this? How and why does this reflect the problems of early cartographers?

Unit IV, Cartography III: Networks

Each child needs a blank sheet of paper, preferably larger, and a pencil or markers. The teacher must demonstrate this project on the board if it is to be succesful.

The teacher should choose several functions that the children have some knowledge of. As an example, he might choose a market, a home, a produce farm, a dairy, a wheat farm, a flour mill and a bakery. These functions, represented by sketches or labeled boxes, should be drawn on the board with some notion of a likely geographical distribution. Thus, the wheat farm is not likely to be next door to the market, but out of the city in the countryside. The functions are then connected by lines, possibly of different colors though this is not necessary, that show different forms of transportation. Thus, the home might be connected to the market by a line representing automobile, bus or foot travel, with a notation that consumers are being transported from the house to the store, and consumers and bread and vegetables from market to home. The market, in turn, would be connected to the produce farm and the bakery by lines indicating, in most cases, truck traffic, with a notation of the goods being moved. The bakery would be connected to the dairy and wheat farm, by truck or rail, the dairy to wheat farm and market, and possibly to the produce farm as a supplier of fertilizer.

The children should then proceed to make their own maps of transportation networks, hopefully including new material. It should be pointed out that a unidirectional, straightline chart, of

say oil, from well to refinery to gas station to car, shows only the least half of what this project should develop. The multi-directional inter-connectedness of functions is the more important concept, along with multiple uses of each aspect of the transportation system. A single highway should be used for moving both a variety of goods from producer to distributor, as well as consumers and workers from home to stores or work places (see Figure 25).

Blue stands for wool.
Brown stands for roads
Pink stands for clothes.

Stacy Reed

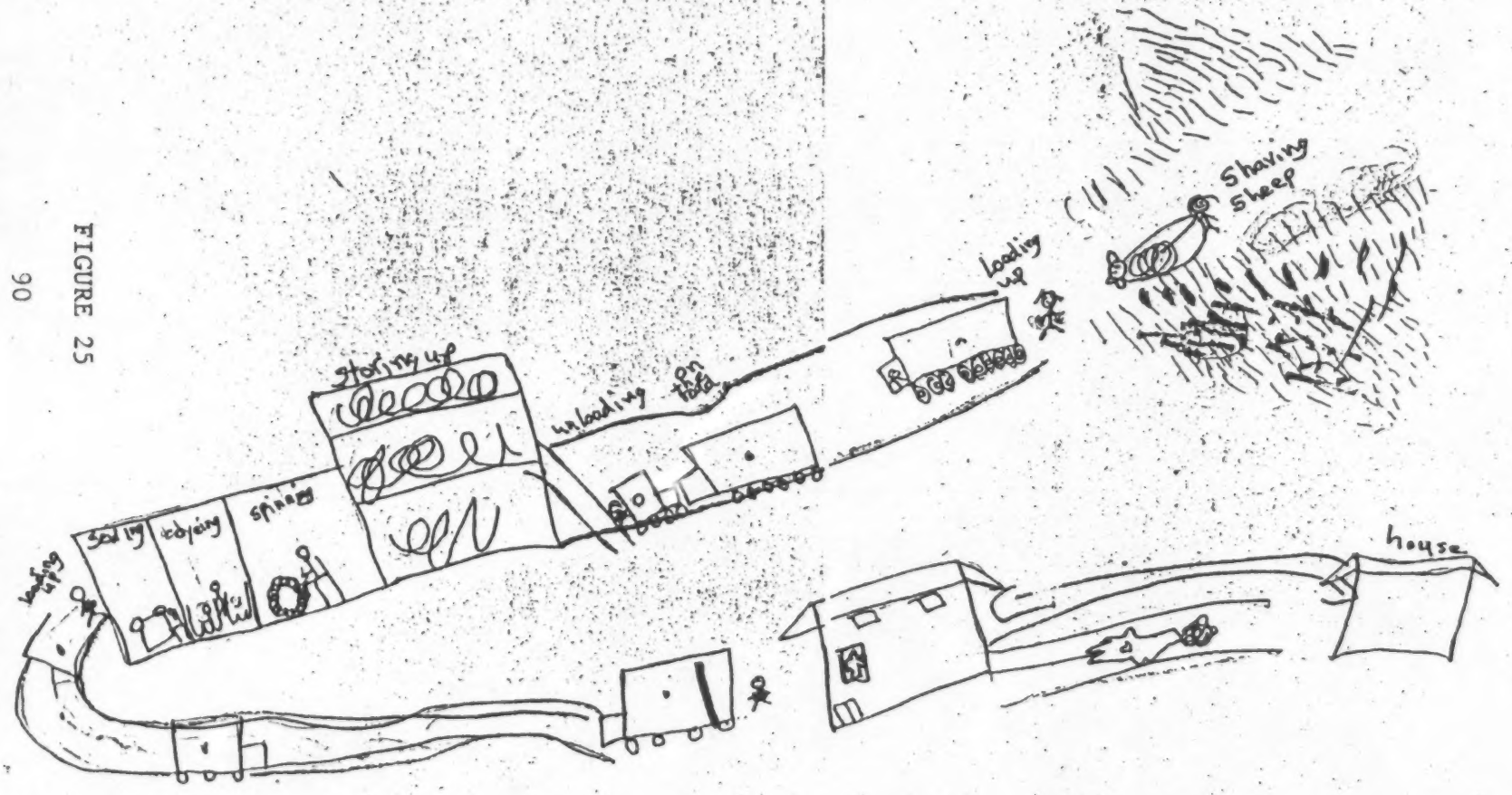


FIGURE 25

UNIT V

PRODUCTION

This unit both begins and ends the economic cycle. The children should understand that while no consumption is possible without production, no production is possible without consumption. These are interdependent elements of a whole, both serving the other. It is possible to think of many examples of how production is tailored to consumption - where products are made for certain needs and tastes. It is equally easy to find examples of consumption being fit to production - in a certain sense this is always the case, since no one can consume what does not exist. A problem for the class to consider is whether this should go on in a piecemeal way, or whether communities should make conscious decisions on how consumption and production should serve each other, and how this might be accomplished if it is found to be desirable.

Unit V, Seminar I: Production

What does "production" mean? The class has already examined needs and the things that satisfy them; the distribution and transportation of these articles when they take physical form; and some of the monetary relations behind exchanges of goods. Now it remains to be shown how goods are created and how this influences the relations of exchange.

Production is a term which includes all facets of creating goods. Before a shoe or a plate of spaghetti can be used to satisfy human wants, it must be produced. The children should be able to organize a list of job functions into commercial and productive categories.

How does production effect exchange? It is manifestly true that things which require no effort to obtain are non-economic. In general, air cannot be sold for this reason. If, however, pollution proceeded to the point at which it became necessary to process all air before it could safely be inhaled, i.e. to perform work on it, it would then become a part of the economy, it would become saleable. In fact, under the circumstances, nobody would expect to get it for free. It should be clear from this example that while the air is the thing being used by the consumer, what is being paid for is the labor of producing it. The children should be able to use this information to rank goods according to both their cost and the relative difficulty of making them. In general, items should hold the same rank in both scales.

Unit V, Seminar II: Division of Labor in the Classroom

This discussion explores how tasks are divided up in the classroom setting: between teacher and students, among students, between different teachers. In Council Grove most everyday maintenance tasks were performed by the students on a rotation basis - each child changed jobs at the beginning of every week. This provides a concrete experience basis for understanding the division of labor. The children should discuss the advantages and disadvantages of dividing up such tasks, both in principle and according to the particulars of division in use. They should suggest alternative divisions of labor.

The children should also list the existing divisions and see how they can be altered. See what tasks may be divided into two or more separate tasks, and which can be combined into one.

Unit V, Seminar III: What is the Basis of the Division of Labor?

The class has looked at some of the advantages in efficiency and variety that the division of labor makes possible. Now they should inspect the social basis of different schemes for dividing up jobs.

Skill is one criterion. Proponents suggest that each person should do what they are best at, thus providing society with the greatest product. Opponents contend that the desires of the working person must be considered, and that what people are best at is largely a matter of training, not innate ability.

Tradition is another criterion. In many societies wealth and occupation are passed from parents to children, so that a son is likely to have the same position in society as his father. This is open to criticism from both parties in the skill debate. What defences of this system can the children imagine?

Egalitarian distributions are another alternative. Some people argue that it is not necessary to get the most out of every worker; that some amount of productive efficiency must be sacrificed to the principles of fairness and equality. This can be done by having people move from one job to another, rather than being tied to one occupation. Others claim that this is too inefficient, and would cause everyone to have to work much harder to make the things society needs (See Figure 26).

Council Grove News
Pathfinders' Edition

Yesterday morning we broke up into 3 research committees: The dairy committee, the clothing Factory committee, and the tools committee. The purpose of these committees was to find out what to do different manufactured goods have in common. Example: What does glass, windows, and mirrows have in common. Answer: The are all made of glass and are made at the same factory. After grouping the products that were manufactured in the same place, all the committees used library books and took notes on how each of these products were made. After we finished our research we wrote reports and discussed our research data (information) with the whole class.

Today we finished our research and began building a dairy plant and clothing factory. Also, we discovered the basic science of pulleys and levers.

Reported and partially written by Stacy Reed

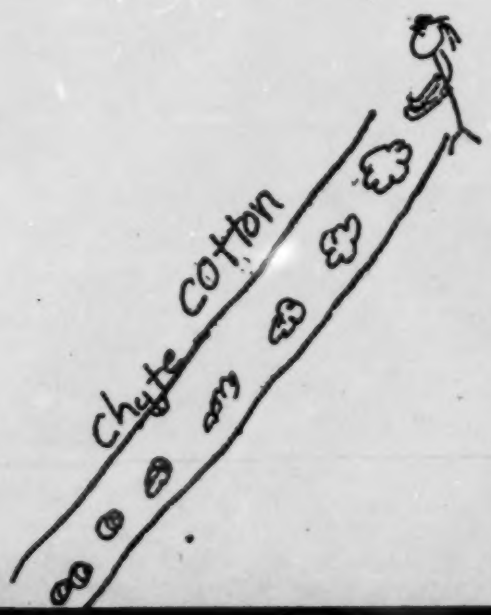


FIGURE 26

Unit V, Seminar IV: Interdependency

The purpose of this discussion is to make clear to the students that the division of labor means interdependency. The very reason for dividing up tasks is so that, by concentrated effort, each task may be accomplished more efficiently. The flip side of this coin is that no one in such a system is performing the complete task at all, let alone efficiently. In the contemporary context it is quite clear that no one can perform all the tasks necessary for survival by himself. It is conceivable that an individual could, by reducing his needs to the most direct subsistence, maintain life independent of others, but only on the basis of, at the very least, socially gathered knowledge and technique.

By separating the activities necessary to secure life and well-being into a multitude of smaller tasks, society makes of itself a true entity, rather than a simple agglomeration of discreet individuals. All the children should be able to contribute examples of how the division of labor makes them or others dependent on each other (see Figure 27).

Natheal My Parent Report

In urban planning we are making flow charts; a flow-chart is a map that shows how jobs depend on each other like the Cotton Factory and a loom depend on each other.

The ~~Cottom factory takes~~ the seeds out of the cotton and washes it; then it makes the cotton into a long piece of thread. The cotton thread is taken by truck to the loom. The loom makes the cloth.

FIGURE 27a

Parent Report – Nathe a/
Tuesday the Path-
finders went on a field
trip to the Museum; the
first thing we saw was an
example of Kinetic energy.

Also we are still
working on the flowchart.
Example↘

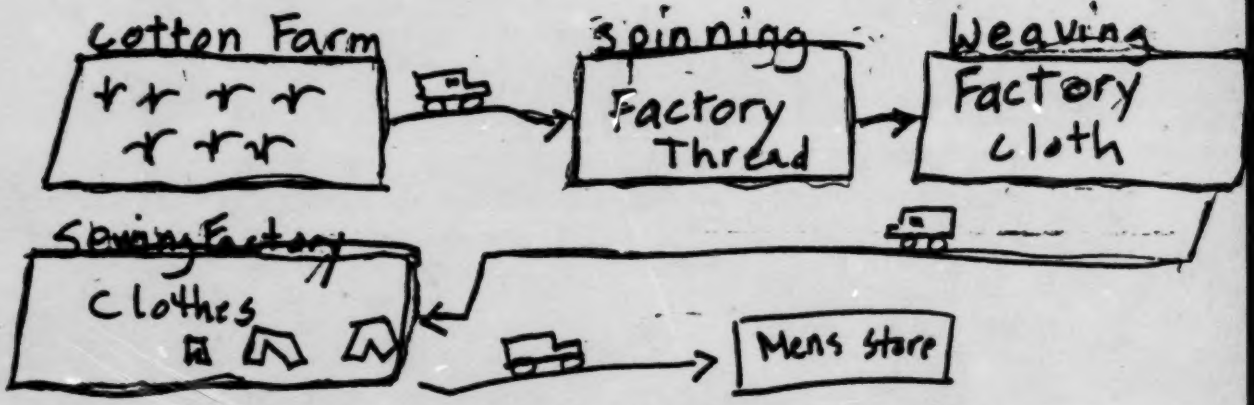


FIGURE 27b

Unit V, Research I: Division of Labor in The Home

As homework, each child should list the various tasks of each member of his family, such as dishwashing, food preparation, educational activities, baby-sitting, bread-winning, decision-making. In class each child should present his information. The class should discuss the various schemes they have heard, offer alternatives and finally each child should make a written report on what he or she would consider a fair division of labor in his or her particular house.

Study Sheet and Survey on Division of Labor in The Home
Unit V, Research I

Answers by:
Nicole Johnson
Age: 7

The division of labor means that the work involved in making somethin is divided into separate tasks, which are assigned to different people. During our ecology periods we divide the labor of cleaning and maintaining our classroom environment. List as many of the divisions of labor during ecology periods as you can:

Can you think of additional ways that labor could be divided during our ecology periods? +he path-finders can put the chairs up & the builders can wash the tables off & the Ecdogists can sweep the floor.

The division of labor also takes place in the home. Write down the members of your family and the different tasks they perform for the family: my grand-mother washes the dishes and sweeps the floor & vacuume. my auntee cleans her babys Dippers.

Can you think of a better way to divide the labor in your family? my mother can wash & Rinse the Dishes while I dry & put up the Dishes. my brother can sweep the pool & check the Filter while My Daddy Feeds the Dog.

Think of a manufacturing or agricultural process you have studied or know something about. Write down as many of the divisions of labor in that process as you can.

One reason for the division of labor is that some people can perform certain tasks better than others. Write down some examples of this:

My Mother Can Comb hair.
My Father Can Cut grass.
My brother Can Sweep &
I can Wash Dishes Better
than My father.

This is not always the reason though. It is not the reason for the division of labor during our ecology periods. Try to think of some other reasons for the division of labor and give examples:

Can you think of a different division of labor to accomplish the same task?

My Mother Washes Dishes & Cookes Dinner.

My ~~Father~~ Cuts the grass.
My brother Sweeps the Swimming Pool! and Dumps the trash Cans
and I Vacuem.

Study Sheet and Survey on Manufacturing and Agriculture
Unit V, Research II

Answers by:
Natheal Paggese
Age: 8

Agriculture is the science or practice of growing plants or raising animals for food or use in manufacturing. Manufacturing is the process of transforming something from a natural state to a form in which it can serve human needs. Read the list of enterprises below. Put an "M" next to each one that is a manufacturing enterprise. Put an "A" by each one that is an agricultural enterprise.

1. Chicken ranch A
2. Bottling company M
3. Auto factory M
4. Corn field A
5. Tuna cannery M
6. Bakery M
7. Tire factory M
8. Cotton farm A
9. Hog ranch A

Think of some other agricultural enterprises and write them down. Wheat field

Think of some other manufacturing enterprises and write them down. Welding factory

Manufacture and agriculture have this in common: They both use human labor to change things from one state to a more useful state. Food does not just grow itself, at least not enough to feed very many people. If it did, no one would take the trouble to be a farmer. Nor do cars build themselves, or houses build themselves. People must use their labor to create these things. Since all manufacturing and agricultural enterprises need human labor, what makes one

Think of a manufacturing process that you, yourself, could not do even if you had the right tools.

ladder

From this you can see that people and machines are interdependent. In order to make all of the things that people need and want, people must use machines, or tools. At the same time, without people to use them, as well as to build them, tools and machines would be worthless, or would not exist at all. In the same way, manufacturing and agricultur are interdependent. It it were not for agriculturalists making people's food, they could not survive to manfacture things. And if it were not for manufactures making the tools and machines that farmers need, farmers could not grow very much food. Many products need the labor of agriculturalists and of manufacturers before they are complete. Some clothing is an example. Some clothing is made from cotton. Cotton comes from a plant that must be grown. But cotton alone does not make clothing. The cotton must be spun into thread, the thread must be woven into cloth, and the cloth cut out and sewn together into clothes. Along the way many processes are used, some agricultural and others manufacturing. Think of another product that is the result of both agricultur Think of another product that is the result o both agricultural and manufacturing processes and write it down.

cotton gin peanutfield

Think of a manufacturing process that you, yourself, could not do even if you had the right tools.

Make a Mirror

From this you can see that people and machines are interdependent. In order to make all of the things that people need and want, people must use machines, or tools. At the same time, without people to use them, as well as to build them, tools and machines would be worthless, or would not exist at all. In the same way, manufacturing and agriculture are interdependent. If it were not for agriculturalists making people's food, they could not survive to manfacture things. And if it were not for manufactures making the tools and machines that farmers need, farmers could not grow very much food. Many products need the labor of agriculturalists and of manufacturers before they are complete. Some clothing is an example. Some clothing is made from cotton. Cotton comes from a plant that must be grown. But cotton alone does not make clothing. The cotton must be spun into thread, the thread must be woven into cloth, and the cloth cut out and sewn together into clothes. Along the way many processes are used, some agricultural and others manufacturing. ~~Think of another product that is the result of both agricultur~~ Think of another product that is the result of both agricultural and manufacturing processes and write it down: notebook, bed window

Unit V, Cartography I: Product Mapping

Take an ordinary, everyday object such as a pencil. The simpler the item is, the better. On the board, write "pencil". The task of the class will be to make a chart of the division of labor involved in producing it. In the case of a pencil, this would involve several processes of cutting, turning, painting, inserting the lead, bonding the wood, attaching the eraser, stamping the manufacturers' logo on the product, packaging, accounting, storage, and distribution. All of these should be written on the board and connected in their proper order to the pencil. If necessary, some children should be assigned to research aspects of the process that the class does not know about (see Figure 28).

rolling cloth
cloth
cutting table
cloth
sewing machine
thread
zoom
cloth
unloading cloth to and floor
truck
By: Shirlyce Manning
Age 7

FIGURE 28

Unit V, Cartography II: Color Contour Maps

Materials required for each set of four students:

4 sets of Cuisenaire Rods
1 piece of centimeter grid graph paper
1 set of markers or crayons that more or less duplicate the colors of the rods

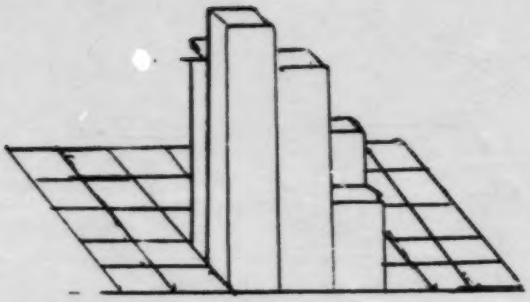
The teacher should demonstrate the technique of making a terrain feature such as a mountain or valley, by placing rods vertically on the squares of the graph paper (see Figure 29). All the groups should have the opportunity to create their own relief map by this method.

Now that each group has a map, what are some benefits and liabilities of this technique? It shows elevation more accurately than the map symbols previously used, and can be viewed in perspective. Since it is a model of the terrain features in question, in this case imaginary ones, it is easy to read, a real 'feel' for the terrain can be easily had. On the other hand, it is delicate, prone to fall apart. If this problem is solved by gluing the pieces together, it is still heavy and bulky, as oposed to maps on paper, several of which may be rolled or folded up together. Lastly, it abstracts curves into rectilinear steps.

How can these problems be overcome? Children should be given an opportunity to suggest solutions before the teacher offers them.

Moving From Three to Two Dimensions

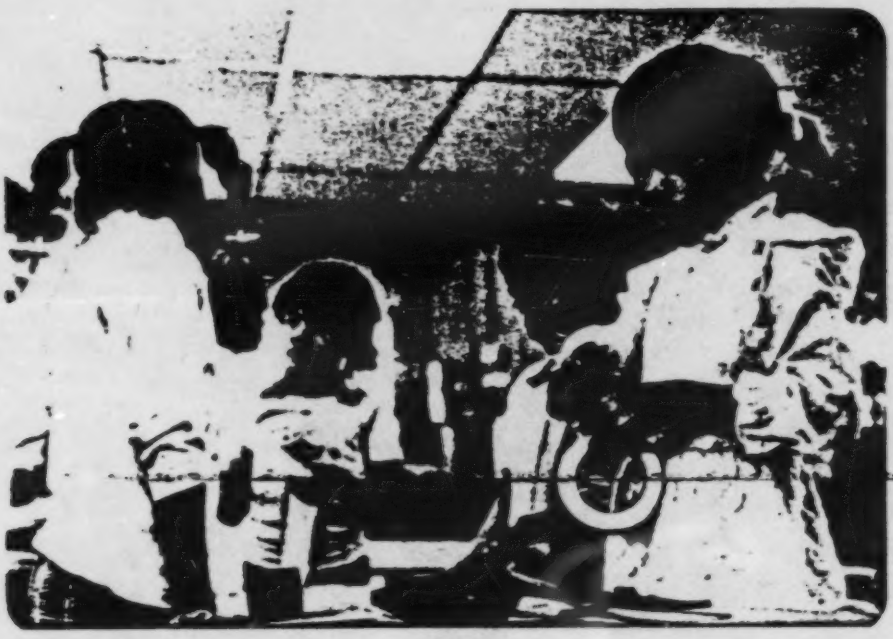
From the side the map may be represented as a two-dimensional picture. This, however, disposes of much information in most cases, depth not being apparent and many features being hidden



placing rods for
relief map

FIGURE 29

by those in front. From the top, however, assuming no caves or overhangs (which are not possible if the procedures have been followed), only the problem of depth, in this case read as elevation, persists. Viewed from directly above, the interfaces of the rods will duplicate the grid of the graph paper. From this perspective it will be difficult to identify the elevation of various parts, except by the fact that each elevation is a different color. All areas two centimeters above the paper will be red, those five centimemters above the paper will be yellow, etc. A two-dimensional map of these features could then be made by coloring each square of graph paper the color of the rod that had been on it (see Figure 30). A key would obviously be necessary to read the map correctly, though some features might be intelligently guessed at by the patterns of color, if one did not know the elevations they represented.



CENTIMETRE GRAPH PAPER

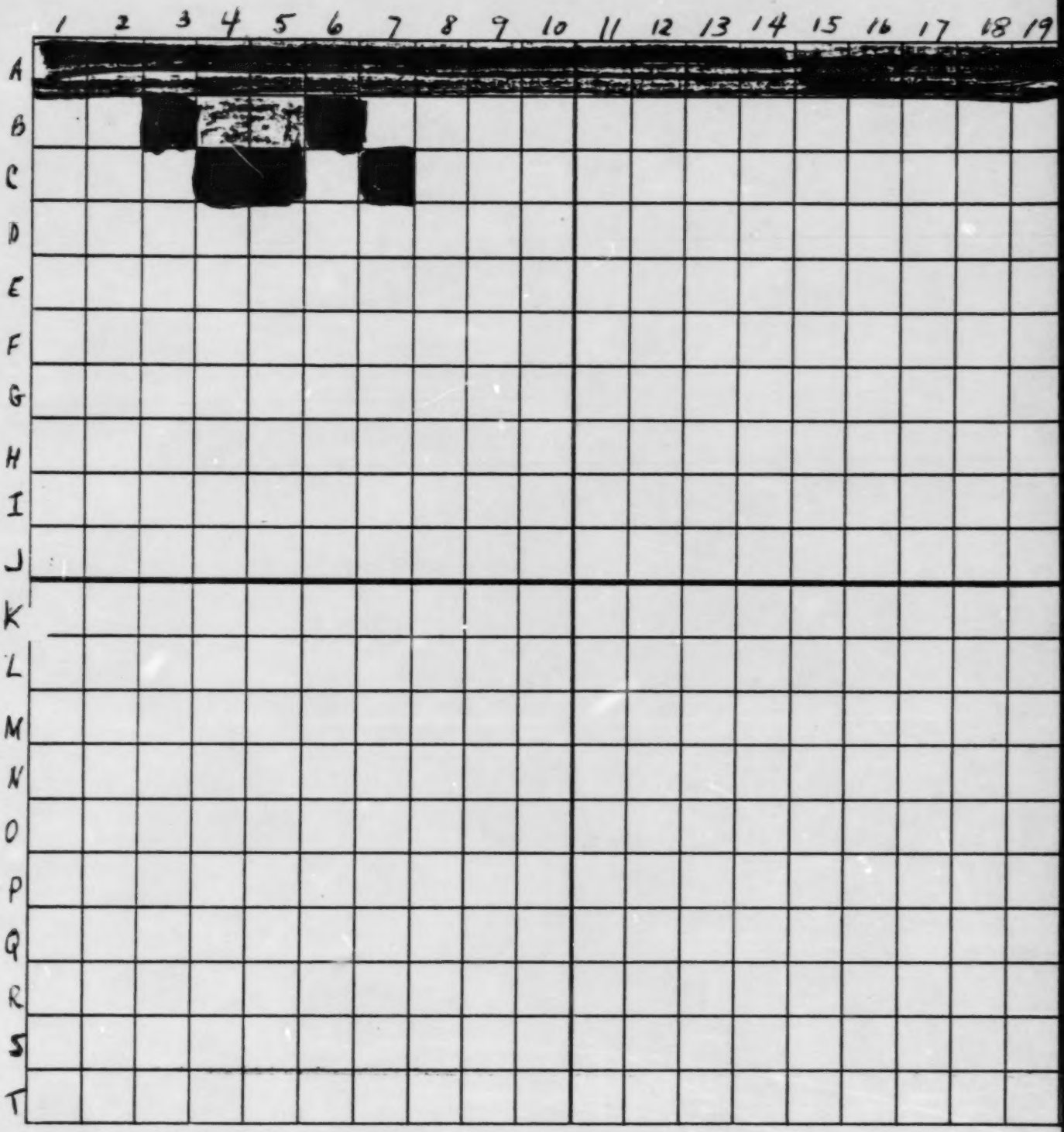


FIGURE 30

Unit V, Cartography III: Line Contour Maps

After several maps of real and imagined features have been made using the color-coded mapping system, the transition to contour line can be made. The teacher should simply demonstrate on the board that by outlining all the areas that would, in the earlier system, be all of one color, and then marking the outline with a figure indicating elevation, that a map showing elevation can be made with only one color.

What advantages does this system have over the color coding system? 1) The number of discreet elevations is not limited to the number of distinguishable colors; it is in effect infinite. 2) Elevation information is available directly on the map, without referring to a key. 3) Such maps require less materials to produce and are consequently cheaper to make. 4) Since colors are not being used to indicate elevation, they can be used to indicate other features such as political districts, population density, income, foliage, climate, rainfall, size or type of buildings, mineral resources, geological zones, or any number of things. In combination with map symbols this enables a single map to carry a great deal of information in a clearly readable form.

What disadvantages does the system have? 1) Contour lines are sometimes confusing, when compared to colors, as sometimes one cannot tell whether the line one is looking at is the 100' line or the 110' line. 2) Contour lines sometimes can be confused with other map symbols such as longitude/latitude lines, highways, railways and telegraph lines, or routes of march, weather patterns

and other superimposed items. 3) It is harder to tell at a glance whether land is rising or falling in a given direction.

Each child should duplicate one of his/her color-coded maps as a contour map, and then make a contour map of some real feature, such as a pile of blocks or rods.

TABLE MODEL

This project is divided into two phases. Each of them will be extended over a period of weeks. The first phase involves the construction of a relief map on which will be built, in the second phase, a model community.

Phase Two is, in many senses, more a part of the Dramatic Play curriculum than of the cartography track. Once the physical features of the natural environment have been constructed on the model, the children will make a variety of decisions, based on their experiences with the tool model, on how to plan and construct their own city. The actual construction of the city is in many respects secondary, although it is essential as a test of the class' conceptual progress.

Phase One

(1) Scale - The purpose of the table model is to make available to the children a scale in which a greater number and variety of job functions can be built, so that their interactions can be better understood. The limitation of the tool model is that physically, in most classrooms, the model is limited to a few city blocks (not counting some abstractions of distance used to represent the location of agricultural enterprises), and socially it is limited to the number of functions that can be managed by the

number of children in the class. The table model, therefore, should be constructed in such a scale that an entire community can be represented at once on it, from outlying agricultural areas to downtown manufacturing and commercial districts, as well as suburbs, transportation systems, etc.

A small town can be represented in "N" scale fairly effectively (1/16" to 1'). However, several problems result from the use of this scale: a) Even on a large (10'X5' for example) map only a very small community, with consequently small numbers and types of job functions, can be represented. A major urban center cannot be shown in this scale on a workable size of a map; and b) The comparatively large size of the scale (human figures are available from hobby stores, 1/8" tall) a tremendous amount of detail can be applied. This will slow construction enormously, for no good purpose. The construction of buildings takes a lot of time in this scale, because each individual feature is still of a size to be represented.

A scale in which individual humans are not representable is preferable - if nothing else, it saves the trouble of buying or making a population of thousands to fill the streets and businesses. A scale of 1" to 100' is about right. In this scale buildings are of small enough size that they can be made easily without unnecessary details, and large numbers of them can be fit on the map. In this scale a reasonable large urban center can be represented on a 10'X5' map (see Figure 31).

(2) Map Size - The relief map should probably not be much larger than 10'X5', since, aside from the space it will take up, it will

Parent reports

Nova

I In math I am in group B. The things that I am working on are my times tables. I am on my 6s in my time tables. I am trying very hard to get on my 7s' in time tables.

II In social studies I was on my Tut-ank-amun trip, so I do ~~dotit~~ know a thing about socal studies.

III In cartography we are working on elevation and we are working on heights and high and low places. We have differences of scale like 100, 200 and 300 feet per centimeter and the colored chalk to show 100, 200, 300.

FIGURE 31
115

not be possible for the children to reach things in its center if it is much bigger. Making the map smaller just limits the number of functions that can be represented. An alternative, of course, is to make a large map in sections that can be taken apart for work and fitted together for inspection, but problems of properly mating the edges exist except with special materials.

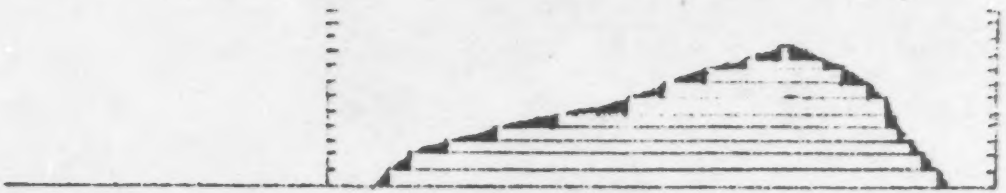
(3) Features - The relief map should contain certain significant geographical features such as mountains, rivers, natural harbors, that the teacher feels pose significant problems in the construction of the city. The basic lay out of the map should be made by the teacher. Besides the features of the map itself, the teacher should have well defined notion of the relationship of this map to its off-map surroundings. This is important for questions of trade and transportation. In general, the teacher should set up a physical problem which the children, as urban planners, will attempt to find solutions to.

(4) Construction - A) Materials: This relief map should be built up of flat layers, cut to map contours and fitted one above the other (see Figure 32). This procedure will firmly establish the concept of contour-line map making and reading for the children, and help them to understand how a three-dimensional object can be seen as a calculus of essentially two-dimensional parts. For this reason, the construction materials are key to the entire project (see Figure 33).

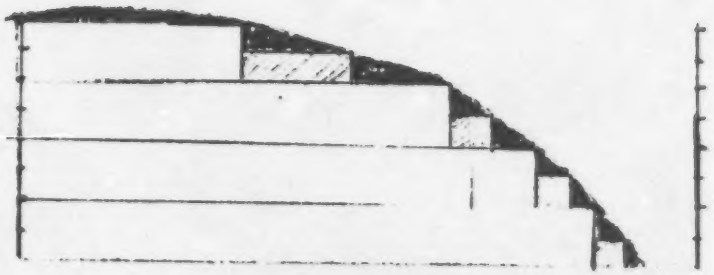
One possibility is using layers of cardboard. This has the advantage of being relatively inexpensive (cardboard can be bought cheaply in hundred-foot rolls), and fairly easy to work with. On the other hand, the cardboard tends to stretch when wet and contract when dry. The result is that, unless firmly attached to an absolutely inflexible foundation (concrete, perhaps), the layers, as they dry and shrink after being glued in place, will pull toward the center, tending to bend the foundation up at the edges significantly. Therefore, the procedures for working with cardboard are included here only because it is a readily available substance; it is less than ideal.

First a foundation must be made. A base of 3/4" plywood braced on the bottom by 2X4's every eight to ten inches should provide a fairly rigid foundation.

The teacher should make, on butcher paper or similar material a contour map of the model-to-be. Because corrugated cardboard is only about 1/10" thick, there will be about 10 layers to the vertical inch. A mountain (hill) of only 500' elevation would therefore be represented by fifty contour lines, and consequently

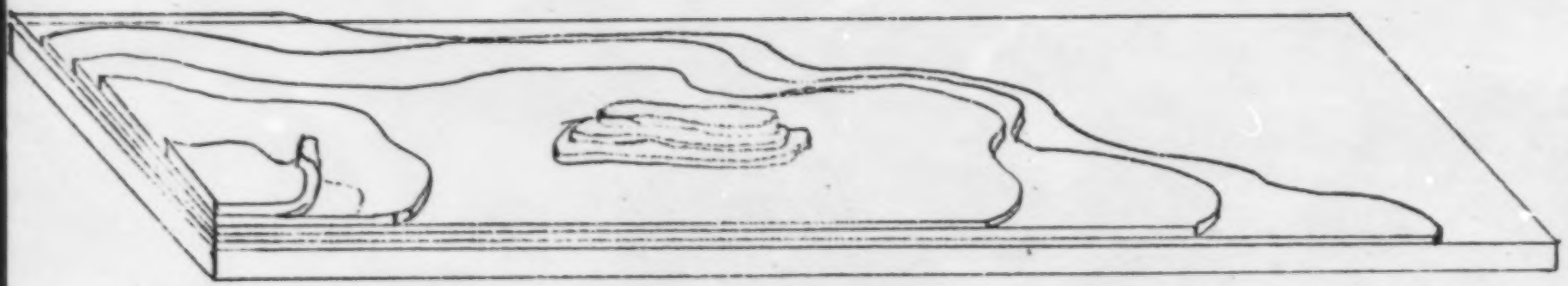


Anglular steps approximate a curve



smaller steps approximate more closely

FIGURE 33
119



Perspective view of table model

(size of layers exagerated, Number of layers reduced)

fifty layers of cardboard. This should be kept in mind, to avoid an excessive number of layers.

Each contour line should be labeled with its elevation, in layers. In other words, the fourth layer would simply be labeled '4'. If, as in the case of twin peaks, there are separate contour lines (non-contiguous) of the same elevation, they should also be lettered to identify which peak they belong to. There will then be Peak A and Peak B, with the layers belonging to each, labeled with the appropriate letter.

Centering lines should then be drawn on the map, such that every separate contour, or in the product, each separate layer, is intersected by at least two non-parallel lines.

After discussing the map features, the teacher should demonstrate how to transfer the contour lines from the map to the cardboard. First, place a sufficiently large piece of cardboard on the floor. Then cover it with carbon paper, carbon side down. If large pieces are not available, small ones may be taped together. Then place the map, face up, over the carbon paper. The copier then establishes which line is to be copied, and traces it with a pen or pencil, pushing sufficiently hard to transfer the line via the carbon paper to the cardboard. Both the contour and the centering lines should be traced. Note: it is important that the map and the cardboard maintain an exact correspondence throughout the copying procedure or distortions will result. Pins can be used, or tape, to hold the two together.

After the cardboard has been marked with the countour and centering lines, it should be cut out to the proper shape. The

ideal tool for this purpose is a wall-paper cutter. These tools are cheap and available from any wall paper store. They consist of a hollow handle and a razor sharp blade, a short length of which sticks out from the handle. When this part of the blade gets dull, it can be snapped off and the next part extruded, so that a child need never use a dull tool. This is important, as it is much more likely that a child will slip and cut himself with a dull tool than with a sharp one.

The teacher should demonstrate basic safety procedures:

1. Never cut toward your hand, always away.
2. No more than one person should work on a given piece at a time.
3. Blades should be retracted whenever they are not being used.
4. Blades should be retracted when handed to another person.....

Now the child need only follow the contour line (not the centering lines) with the cutter, mark the piece he has cut out with the proper identifying letters and numbers, and go on to the next.

The lowest layers should be cut out first, as they will be glued first to the foundations. A very thin solution of white glue works very well. It should be painted onto the foundation with a paint brush, and the layer of cardboard carefully smoothed down on top of it. It takes some practice to avoid air bubbles. For very large pieces, areas about one or two feet long should be glued at a time, to avoid wrinkling and bubbling.

It is useful to place the cardboard down before the glue, get it properly alligned, trace around it with a pencil, put down the glue and then replace the cardboard inside the traced perimeter.

The pieces can be alligned using the centering lines. Using the contour map, the ends of all the centering lines should be marked on the foundation, and a nail driven into the edge at each (not in the top, the cardboard goes there). Strings tied to the nails will duplicate the centering lines. The cardboard being slipped underneath then, the centering lines on the cardboard can be shifted to match those of the string (see Figure 34).

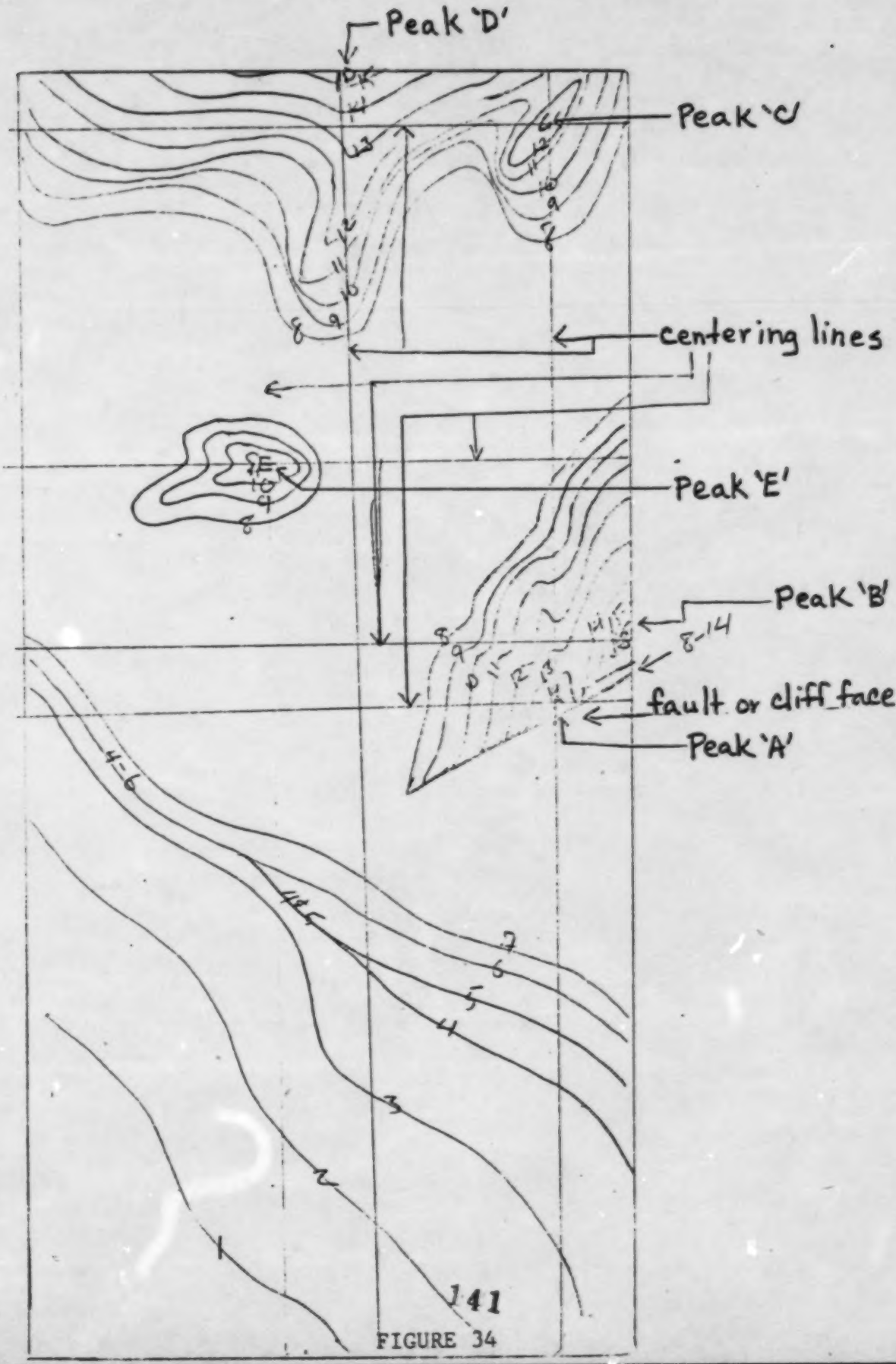

Peak 'D'
Peak 'C'
centering lines
Peak 'E'
Peak 'B'
8-14
fault or cliff face
Peak 'A'
4-6
7
6
5
4
3
2
1

FIGURE 34

(2) Foam - Foam is somewhat more difficult to work with in some respects - it is harder to cut cleanly, it breaks, but has many advantages over cardboard. The greatest advantage is that it does not shrink, so the map will not be distorted.

As far as I know, the best foam for this purpose is that used by surfboard manufacturers. These manufacturers throw out large quantities of it, in 10'X1'X1' rods. These can be sliced into 1/4" slices with a band saw. Since the slices are thicker than cardboard, less layers need to be used, and higher mountains can be made. At the end of the project the corners can be filed down to yield a smooth curve to every surface. (Layers greater than 1/4" thick are not desirable - 1/4" thick layers already represent steps of 25', the peak of a small house's roof.) In general the same procedures can be used here as with cardboard. In this case, however, a serrated bread knife is a preferable cutting tool, and the children should be instructed to saw, not cut by pressure. This will avoid breaking the foam and making ragged edges. Since the foam blocks are narrow, several pieces will have to be fitted together at the same elevation in many cases. This makes accurate tracing and cutting very important, and also makes the centering lines extremely valuable. It also presents a possibility not available with the cardboard model - if the layers are all arranged so that seams fall directly above each other, the map can be divided up into vertical cross-sections, in which can be carved and painted a wide variety of sub-surface geological features (different kinds of rock, stratification, faults, subterranean streams, caves, volcanic features, oil pools etc.). While some

of these features can be represented around the edge of a cardboard model, the effect is much more striking if the map can be pulled apart to reveal its 'insides'.

If foam is used, it should be covered with a sealer when the map is complete. This will keep it from crumbling.

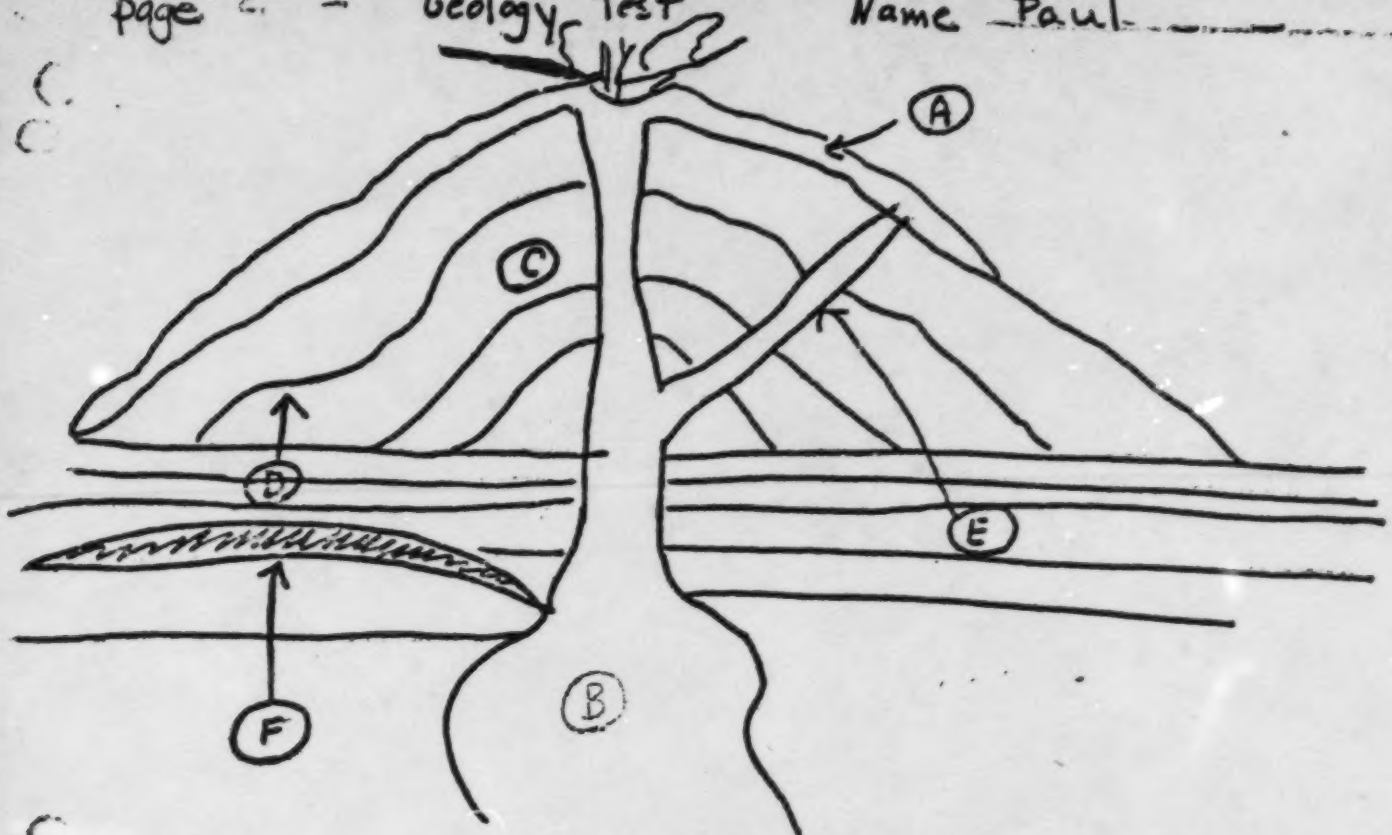
Use of the Table Model

The Table Model is useful in much the same way as the Tool Map. The difference in scale between the two is important, however. The small scale of the Table Model prevents the manipulation of 'personna', and makes the imitation of every-day transactions unfeasable. On the other hand, it allows the class to deal with larger issues and a more sophisticated urban model. Because the scale is small, many more job functions can be included than in the Tool Map, and the proportion between housing and industry, town and country, open space and development can be better portrayed. However, it is possible for the children to understand these issues fully only from their experience with the issues that arise from the Tool Map.

The basic terrain of the Table Model should be considered essentially immutable once it is constructed. The man-made aspects, however, should be freely altered to test ideas as they come out of the Tool Map experience and other experiences with the Table Model. The Table Model is a tool primarily for physical planning, although social considerations, of course, enter in. The Tool Map is a device for exploring and planning the social modes of a community. It is this experience which must form the basis for intelligent physical organization on the Table Model.

The Table Model can also be used to introduce and illustrate geology concepts. The teacher should explain the relationship between the surface feature of the earth that children can observe, such as mountains, faults, valleys, etc., and the sub surface dynamics which cause them (see Figures 35, 36, 37, and 38).

Page 2 - Geology Test Name Paul



D (A) is
(1) Volcanic rock
(2) Lava
(3) Magma
(4) igneous rock 1/2

(2) (B) is (1) Lava
(2) volcanic rock
(3) magma ✓
(4) igneous rock

(3) (C) is (1) lava
(2) igneous rock
(3) volcanic rock ✓
(4) magma

(4) (D) is most likely
(1) ash ✓
(2) volcanic rock
(3) lava
(4) sediments

(5) (E) is (1) a side vent ✓
(2) a magma chamber
(3) ash
(4) pumice

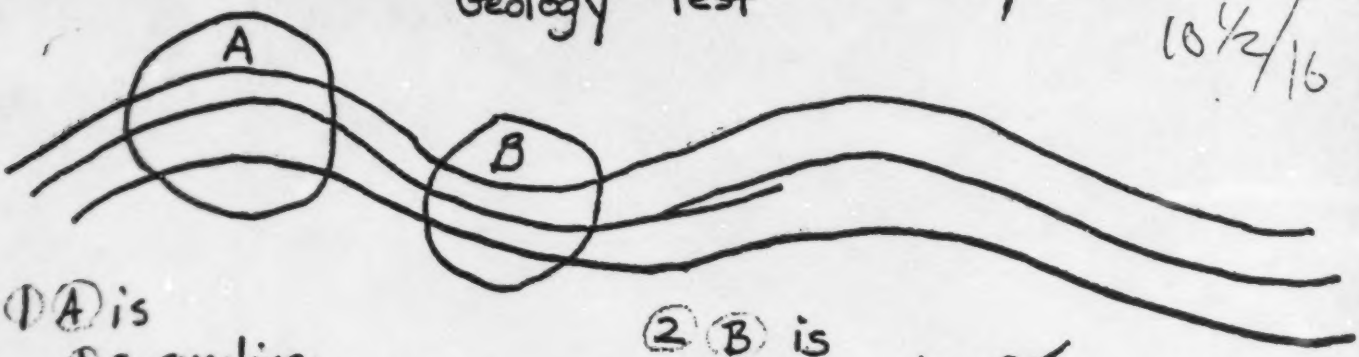
(6) (F) is (1) an extrusive sheet
(2) an intrusive sheet ✓
(3) a vent
(4) a caldera

FIGURE 35

Name _____ Date May 1 1978

Geology Test

10½/16



(1) (A) is
1. a syncline
(2) an anticline ✓
3. a normal fault
4. a volcano

(2) (B) is
(1) a syncline ✓
2. an anticline
3. a normal fault
4. a volcano

(3) (C) is
(1) a normal fault ✓
2. a thrust fault
3. a syncline
4. a hanging block fault

(4) (D) is
1. a normal fault
(2) a thrust fault ✓
3. a hanging block fault
4. a volcano

(5) When magma turns into rock it is called
1. sedimentary rock
(2) igneous rock ✓
3. metamorphic rock

(6) Lava is (1) extrusive magma
(2) intrusive magma X

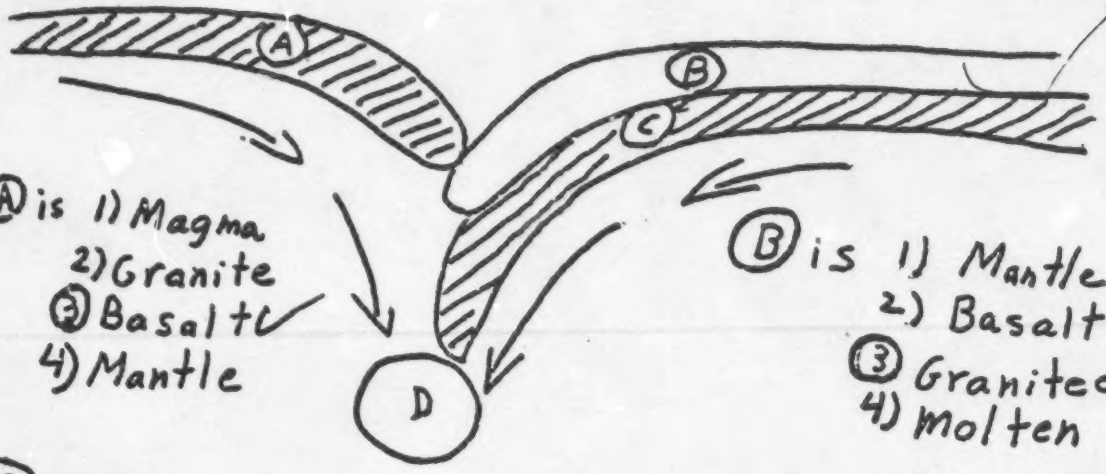
(7) What is the difference between lava and magma?

(8) What is the difference between lava and volcanic rock? X

the difference between Lava and magma is that magma is hot melted rock and lava is not.

FIGURE 36

Name Edie

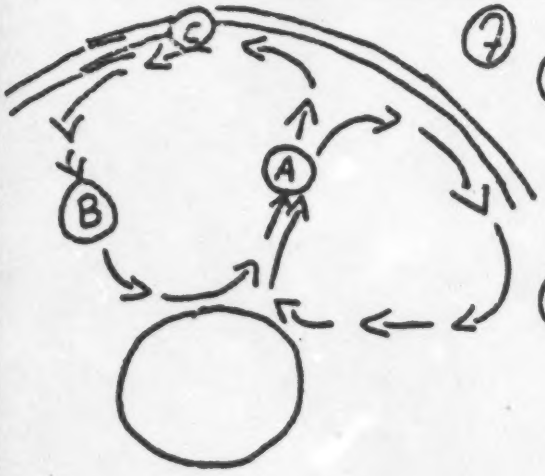


A is 1) Magma
2) Granite
3) Basalt ✓
4) Mantle

B is 1) Mantle
2) Basalt
3) Granite ✓
4) Molten

C is 1) Basalt ✓
2) Mantle
3) Granite
4) Magma

D is 1) the lithosphere
2) a batholith
3) a subduction zone ✓
4) a normal fault



7) A is 1) hotter than B
2) cooler than B
3) cooler than B & C
4) hotter than B & C ✓

8) B is 1) hotter than A but cooler than C
2) the same temperature as A
✓ 3) hotter than C but cooler than A
4) hotter than A & C

True or False:

9) Cold things are lighter than hot things. T (F) —

10) Heat rises. (T) F ✓

11. Cool rock is harder than hot rock. T F

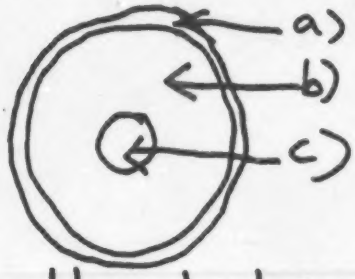
FIGURE 37

147

Plate Tectonics Test 12/22

Ede-
May 8 1975

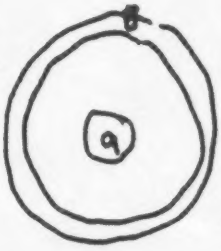
1. Label each part.



a) lithosphere / Crust /

b) Crust +

2. Heated rock is { ① heavier X ② harder ③ lighter ④ the same as } cool rock

3. 

on this diagram, place an ⓐ on the part that is hottest.
Place a ⓑ on the part that is hardest.

4. What happens to the parts of the mantle that have come near the crust and cooled?

It breaks Because it is hot and when it cools it Breaks.

5. What causes parts of the mantle to rise?

The core in the middle.

FIGURE 38

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